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ABSTRACT

This report presents a planning model which shows how to utilize various sources of occupational and educational information in order to enhance planning efforts with state department of education personnel and other education agencies at the secondary and community college levels. A vocational program planning model is presented in seven stages: (1) review the state plan for needed thrusts and priorities; (2) identify the occupational universe from which programs will be projected; (3) calculate and determine the programs needed; (4) insure that program areas are trainable; (5) determine employer hiring practices; (6) examine other critical elements such as urgency of need, adverse impact on other segments of education, fiscal impact, and student demand; and (7) recommend new programs for implementation. A vocational curriculum development process is presented and includes a description of the nature of the process, an outline of a systems approach (Data Applications Needs Assessment System--DANAS) including a flow chart, and the planning, organizing, and evaluating processes. Tables and charts are presented throughout the report and a twenty-page appendix includes USOE Program Groups in use in Oregon, community college and high school program projections, and a Data Application Needs Assessment Form. (BL)

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GUIDELINES FOR USING DATA IN VOCATIONAL PROGRAM AND CURRICULUM PLANNING AT THE STATE AGENCY LEVEL

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Developed Under the Grant
Models for the Use of a Data Base in Planning
State and Local Vocational Programs

from the

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U.S. Department of Health, Education, and Welfare
Office of Education
Bureau of Occupational and Adult Education

Career and Vocational Education Section
OREGON DEPARTMENT OF EDUCATION

March, 1977

CE 013 571

PREFACE

The Oregon Department of Education, Career and Vocational Education Section, under the terms granted by the U.S. Office of Education has prepared this document for use by its program and curriculum planning staff. Other states' planning units may also find the guidelines useful.

The study was undertaken to show how to utilize various sources of occupational and educational information in order to enhance planning efforts with Department personnel and other education agencies at the secondary and community college levels. Information generated from the output of this study has in part been used as the base for input into the 1978 annual plan and 1978-1982 five-year plan for Vocational Education in Oregon. An ongoing effort is being exerted to evaluate the efficiency of this input.

Special thanks are in order for those state and local educational planners who gave so freely of their valuable time in helping to make this product a useful one.

March, 1977

TABLE OF CONTENTS

Section		Page Number
VOCATIONAL PROGRAM PLANNING MODEL		1
Introduction		1
Program Planning Stages and Procedures		2
Stage I		3
Stage II		6
Stage III		9
Stage IV		14
Stage V		16
Stage VI		18
Stage VII		21
Conclusion		23
VOCATIONAL CURRICULUM DEVELOPMENT PROCESS		24
Nature of the Process		24
Steps in the Process		25
A Systems Approach		26
DANAS--Data Application Needs Assessment System Curriculum Development		29
Inputs		31
Processes		32
The Planning Process		32
The Organizing Process		39
The Evaluating Process		43
Outputs		48
APPENDIXES		49
Appendix 1-A	USOE Program Groups Included in Oregon's Formal and Informal Clusters	50
Appendix 1-B1	Community College Program Projections	55
Appendix 1-B2	High School Cluster Program Projections	58
Appendix 1-C	DANAS--Data Application Needs Assessment System	61
Appendix 1-D	DANAF--Data Application Needs Assessment Form	62
Appendix 1-E	State Curriculum Advisory Committee (Membership)	68
Appendix 1-F	State Specialists, Career and Vocational Education, Oregon Department of Education	69
BIBLIOGRAPHY		70

LIST OF TABLES

Table	Title	Page Number
I	Program Planning Stages and Procedures	3
II	Program Planning Screening Process	5
III	Occupations in Oregon Grouped Under Maintenance, Heavy Equipment (USOE 17.100301)	7
IV	USOE Instructional Program Groups in Industrial Mechanics Cluster	8
V	Determination of Additional Programs Needed	13

LIST OF FIGURES

Figure	Title	Page Number
1	Stage I and II	4
2	Stage III	12
3	Stage IV	15
4	Stage V	17
5	Stage VI	19
6	Stage VII	22
7	A Managerial System for Curriculum Material Development, Installation, and Evaluation	27
8	Planning Process	34
8-A	A Plan for Curriculum Development	36
8-B	Instructional Strategy Decision-Making	37
8-C	Interrelationships of Subject Matter with Other Selected Aspects of Curriculum and Instruction	38
9	Organizing Process	40
10	Evaluating Process	45
11	Suggested Evaluating Tasks	46

VOCATIONAL PROGRAM PLANNING MODEL

for

SECONDARY SCHOOLS AND COMMUNITY COLLEGES

Introduction

Oregon like other states is striving to improve its method of identifying those vocational programs which should be given priority in the next one and five years. The components of this planning model provide one method which may help to accomplish this goal. Specifically, the model outlines those procedures the vocational program planner at the state level might follow when planning such programs at the secondary or community college level. The application of the procedures analyze labor market demand and supply, trainable qualities of selected occupations, hiring practices of employers, and other critical elements such as urgency of need for the program, adverse impact on other segments of education, fiscal impact, and student demand as input into the decision to continue, change, terminate, or create vocational programs.

The overall assumption for the application of the planning model is that state support for instruction in occupational skills will be given only to those occupational program areas where jobs are available or needed for the maintenance or continued growth of the Oregon economy. This and the other basic assumptions of the model are shown below:

1. State support for vocational programs will be given to those occupational areas where a significant number of jobs are available or needed for the continued growth of the economy in Oregon.

2. Information from the Oregon Employment Division, Department of Human Resources is a valid indicator of employment need.

3. Training in occupational areas will change with changing demand or supply of qualified job applicants.

4. Information for state planning purposes is needed from a source other than the community colleges, per se.

With these assumptions of the model identified, the planner can proceed to draw certain conclusions with some degree of confidence within an established framework and set of parameters.

PROGRAM PLANNING STAGES AND PROCEDURES

Planning at the state level for secondary and community college vocational programs requires the identification and ordering of the necessary planning stages and procedures to complete each stage. Table I outlines the stages that need to be investigated in order to identify the occupational fields that should be considered for program offernings.

Programs as used in this model are defined as United States Office of Education (USOE) instructional program groups. Used in this context, each program can train for one or more related occupations. This will be explained further in Stage II.

TABLE I

PROGRAM PLANNING STAGES AND PROCEDURES

STAGE	PROCEDURE
I	Review the state plan for needed thrusts and priorities
II	Identify the occupational universe from which programs will be projected
III	Calculate and determine the programs needed
IV	Insure that program areas are trainable
V	Determine employer hiring practices
VI	Examine other critical elements such as urgency of need, adverse impact on other segments of education, fiscal impact, and student demand.
VII	Recommend new programs for implementation

Stage I

Program planning first begins with a careful review of the Oregon Annual and Long-Range Program Plan Provision for Vocational Education, hereinafter referred to as the State Plan (see Figure 1). In our planning model it will be assumed the State Plan identifies the priority that all occupational fields should be considered for program recommendation, and that as each stage of the model is addressed certain occupational groups will no longer be considered; the reason being that each stage requires certain conditions be met by each program group identified and that not all such groups will be able to do so. The result is that of say some 200 USOE program groups first considered for program recommendation, only ten may pass the various test criteria. An example of this refinement or screening process is shown in Table II.

PROGRAM PLANNING MODEL

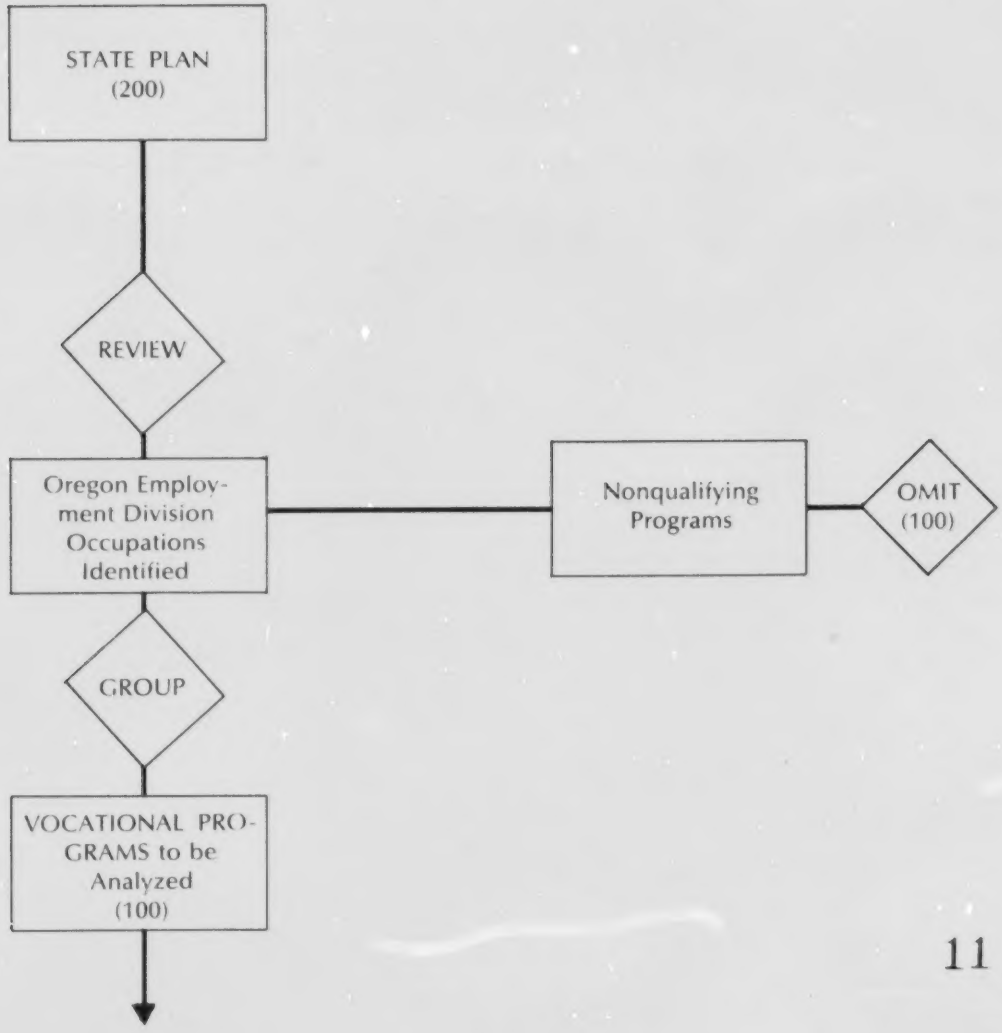

FIGURE I. STAGE I AND II

TABLE II

PROGRAM PLANNING SCREENING PROCESS

STAGE	NUMBER OF PROGRAM GROUPS CONSIDERED FOR PROGRAM RECOMMENDATION
I	200
II	100
III	50
IV	30
V	20
VI	10
VII	10

The following goal, objective, and related activity are examples of those the state level planner might find in the State Plan relating to long-range program planning for community colleges. A similar goal would most likely be in the State Plan for secondary schools.

GOAL 4.0

All persons at the community college level will have available opportunities to prepare for varying levels of initial employment in all occupations offering substantial employment.

OBJECTIVE 4.1

Increase the number of certificate and degree programs offered in community colleges to 550 by 1980.

ACTIVITY 4.1.1

Develop a model long-range plan for recommending vocational programs to be implemented in Oregon's community colleges.

If such a goal had not been included in the State Plan, the planner would need other forms of justification to pursue planning for vocational programs. By searching out such justification, State Plan writers will be alerted to include such topics in subsequent years' State Plans. For the planner then the goal sets the precedent for identifying the complete range of programs that should be considered for recommendation and possible implementation. For purposes of illustration it is assumed that 200 USOE program groups are candidates that might be offered within the state.

Stage II

The second stage, Identifying the Occupational Universe from which Programs will be Projected, identifies those programs for which occupations exist in Oregon. The occupations will be identified by the Oregon Employment Division, Department of Human Resources and be identified from the Division's annual surveys of employers within the state. (All industries are surveyed with the exception of on-farm wage and salary workers. Self-employed workers are not identified for any industries.)

The occupations are then assigned to a United States Office of Education (USOE) instructional program group by the planning staff at the state level. It is these resulting program groups that are subsequently processed through the program planning model to determine which ones will be recommended for

implementation. An example of how certain mechanical occupations are grouped under one such USOE program group is shown in TABLE III.

TABLE III

OCCUPATIONS IN OREGON GROUPED UNDER MAINTENANCE, HEAVY EQUIPMENT (USOE 17.100301)

USOE CODE	OCCUPATIONAL JOB TITLE
17.100301	Knitting Machine Fixer
	Mine Machinery Mechanic
	Treatment Plant Mechanic
	Engineering Equipment Mechanic
	Maintenance Mechanic

Each of the other USOE program groups identified will have a similar collection of occupations common to its instructional theme.

TABLE II, Stage II (also see Figure 1) shows that 100 such USOE program groups were identified in Oregon as having occupations at which there are wage and salary workers. Conversely, 100 (200-100) program groups showed no occupations existing within the state. These were no longer considered for program recommendation. Of those that remained, TABLE IV illustrates the various USOE program groups identified for the Industrial Mechanics Cluster.[1]

[1] A cluster is defined as a collection of USOE program groups that have a core of competencies common in tasks to one another. In Oregon there are 13 such common competency clusters. Included are Agriculture, Marketing, Health, Food Service, Accounting, Clerical, Secretarial, Industrial Mechanics, Construction, Electricity/Electronics, Metals, Service, and Forest Products. Five other such groupings have unapproved status as clusters. These are Child Care, Clothing (fabrics), Institutional and Home Management, Drafting, and Graphics.

TABLE IV

USOE INSTRUCTIONAL PROGRAM GROUPS IN
INDUSTRIAL MECHANICS CLUSTER

USOE CODE	USOE INSTRUCTIONAL PROGRAM
04.030000	Automotive Sales (Service Representative)
16.011300	Mechanical Technology
17.010100	Cooling
17.010200	Heating
17.030200	Mechanic (Automotive)
17.030300	Specialized Mechanic
17.039900	Automotive Services, Other
17.040100	Aircraft Maintenance
17.060000	Business Machine Maintenance
17.100000	Construction and Maintenance Trades
17.100301	Maintenance, Heavy Equipment
17.109900	Construction and Maintenance, Other
17.120000	Diesel Mechanic
17.310000	Small Engine Repair
17.320000	Stationary Energy Sources

A similar listing of USOE program groups has been developed for each of the cluster groupings described in footnote one. (For a complete list of those that have been identified in Oregon and their related USOE program groups, see Appendix 1-A.)

For purposes of illustration this model will address only USOE program groups since they are specialized and can be related easily to community college programs, although they are equally applicable to secondary vocational programs. Should the state level planner in Oregon need to plan for the industrial mechanics cluster (or any other cluster for that matter) at the secondary level the total of all demand and supply estimates for all the related USOE program groups within that cluster (see TABLE IV)(Appendix 1-B2) would

be used. Then each of the stages described in the model would be applied as described when discussing USOE program groups, per se.

Stage III

The third stage, Calculating and Determining the Programs Needed, examines the 100 occupational program groups to find out if there is a substantial need for trained workers. This process requires that the total estimated job openings for the specific USOE program group, less the openings expected to be met or prepared by secondary schools, private schools and other training sources, be compared to the supply of available graduates coming from the community colleges. The difference between the two, i.e., demand less supply, is net demand. This figure is the "real need (demand)" for additional workers or graduates from community colleges. Once determined, the planner computes the number of additional or new programs needed. This is calculated by the following formula:

$$APN = \frac{ND}{\frac{PPC}{PPE}} \Bigg/ AEEP$$

Literally the formula shows that to determine the additional programs needed (APN), the planner must first calculate the ratio of present program completers (PPC) to present program enrollment (PPE) and divide the resulting percentage into the net demand (ND) to determine the necessary enrollment. This

figure is then divided by the average enrollment per existing program (AEEP) to determine the additional programs needed.

An example of how this works can be illustrated by making certain assumptions:

Let:

$$\begin{aligned} ND &= 30 \\ PPC &= 23 \\ PPE &= 200 \\ AEEP &= 25 \end{aligned}$$

Then compute:

$$APN = \frac{\frac{30}{\frac{23}{200}}}{25}$$

$$= \frac{\frac{30}{.115}}{25}$$

$$= \frac{261}{25}$$

$$APN = 10.4$$

For this one occupational program group the above calculation indicates that at least ten additional such programs are necessary to meet the projected net demand. This process is then followed for each of the other 99 occupational program groups identified in Stage II.

By following the foregoing procedure for each of the program groups, the computations will show one of three typical results; that is, programs will

be needed (undersupplied), programs will not be needed (oversupplied), or programs will be in balance (neither over nor undersupplied).[2]

For purposes of program planning, all program groups either oversupplied or in balance are no longer considered for implementation. Those occupational fields where programs are needed (undersupplied) will continue to be considered until the planner can determine their acceptability in view of the criteria discussed in the remaining stages of the model.

Figure 2 shows that fifty occupational program groups may be determined to be oversupplied (25) or in balance (25) with the estimated job openings and consequently are no longer considered for program implementation. The balance of the occupational groups, 50 (100-50), remain in consideration since they meet the criteria that programs undersupplied are retained. Programs undersupplied by one or more programs qualify.

TABLE V illustrates the relationship of supply to demand for three occupational program groups and how they are excluded or retained for further program consideration.

The figures show that programs exceed or are equal to the present number required from community colleges for aircraft mechanic and automotive mechanic. Five additional programs are needed for appliance repairer, however, based on supply and demand estimates (net need) and the other elements applied in

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[2] A detailed discussion is included in Appendix 1-B for selected occupational groups. These are shown by eight digit U.S. Office of Education instructional program titles.

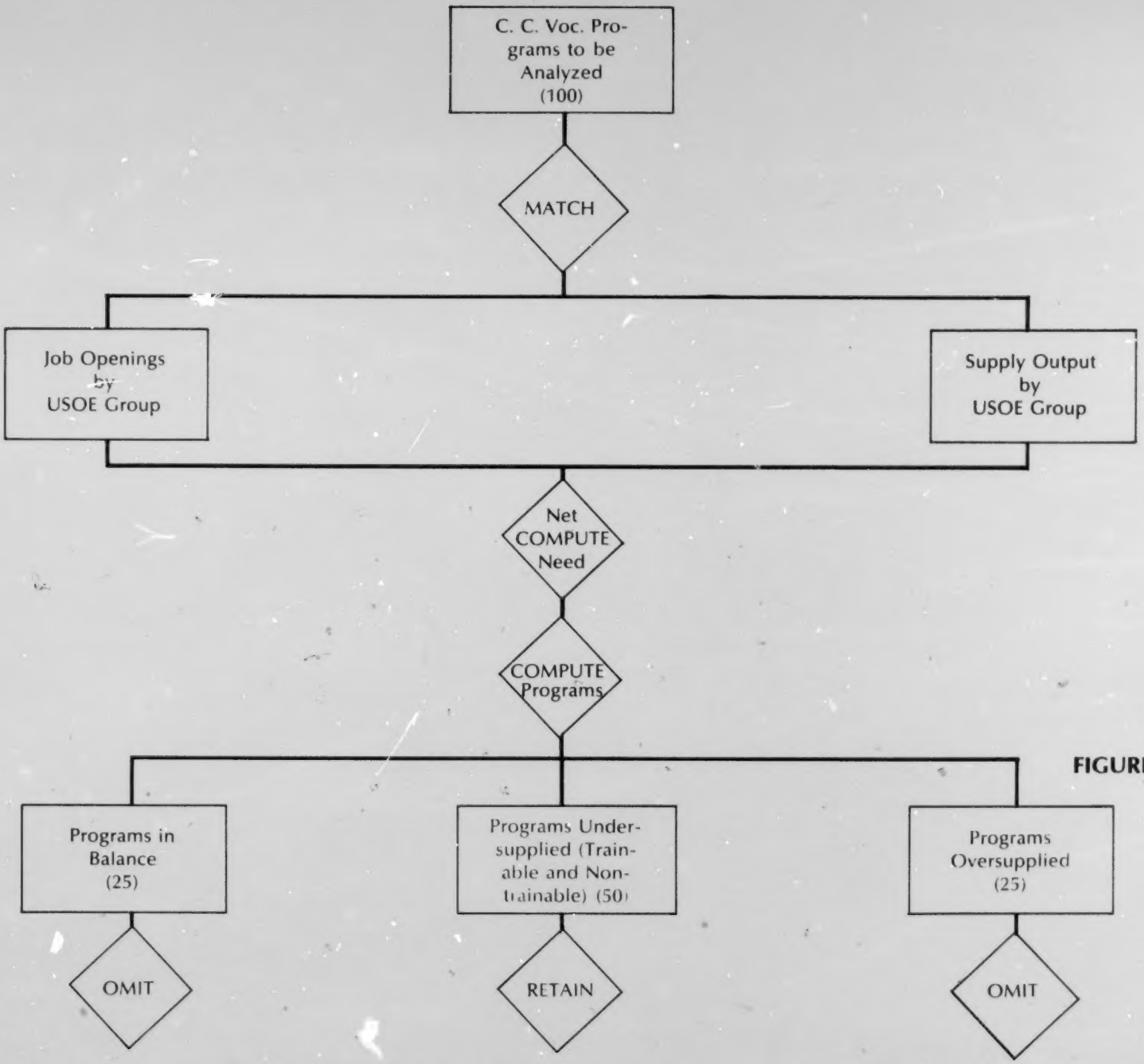

FIGURE 2. STAGE III

the formula.[3] The application of the formula for these program areas is assumed for purposes of illustration.

TABLE V

DETERMINATION OF ADDITIONAL PROGRAMS NEEDED

Sources of Demand and Supply	Aircraft Mechanic	Auto Mechanics	Appliance Repairer
Average annual job opening[4]	-5	20	60
Estimated supply from community colleges	30	40	40
Programs			
Oversupplied	-.2		
Supply in balance		0	
Undersupplied			5

The planner at this point in the analysis will continue to consider for program recommendation the appliance repairer occupational program group and the other 49 fields so identified until each of the other stages have been reviewed.

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[3] These elements include the ratio of present program completions, present program enrollments, and average enrollment per existing program.

[4] In the model the average annual job openings is only that portion that should be supplied by the community colleges. Other training sources will supply the balance of trained workers. If clusters are being reviewed, only the portion of average annual job openings for which secondary schools have responsibility will be used. This will be the total of all USOE program groups within the specific cluster, e.g., industrial mechanics.

In Oregon, estimates of employment and job openings, along with the supply of trained workers can be obtained for each USOE program group by requesting the information from the Career Program Planning System (CPPS), a computerized manpower retrieval system. The source of the demand information is the Oregon Employment Division (as previously mentioned). The supply information is obtained from the federal statistical report for enrollment and completions prepared annually by the Oregon Department of Education in cooperation with Oregon's 13 community colleges and its some 250 high schools. Other supply information in CPPS includes the output from the apprenticeship councils, proprietary schools and four-year colleges.

Stage IV

The fourth stage of the program planning process next needs to be implemented. This step involves a review of the 50 remaining occupational program groups identified in Stage III to determine those that are trainable. Specifically this means that occupational groups considered for program implementation must have reasonable depth of subject matter, warrant instructional time in the classroom, and be less than baccalaureate in nature. Figure 3 shows that 30 occupational program fields were able to meet these criteria. Twenty of the groups were not able to do so. (At this point the planner's work has been reduced by 40 percent since 20 of the 50 occupational program groups no longer qualify for consideration.)

Two examples of occupational groups in this model not meeting such criteria were (1) waitress and (2) mechanical engineer. In the first example, there is presumably a very limited amount of subject content, along with the fact

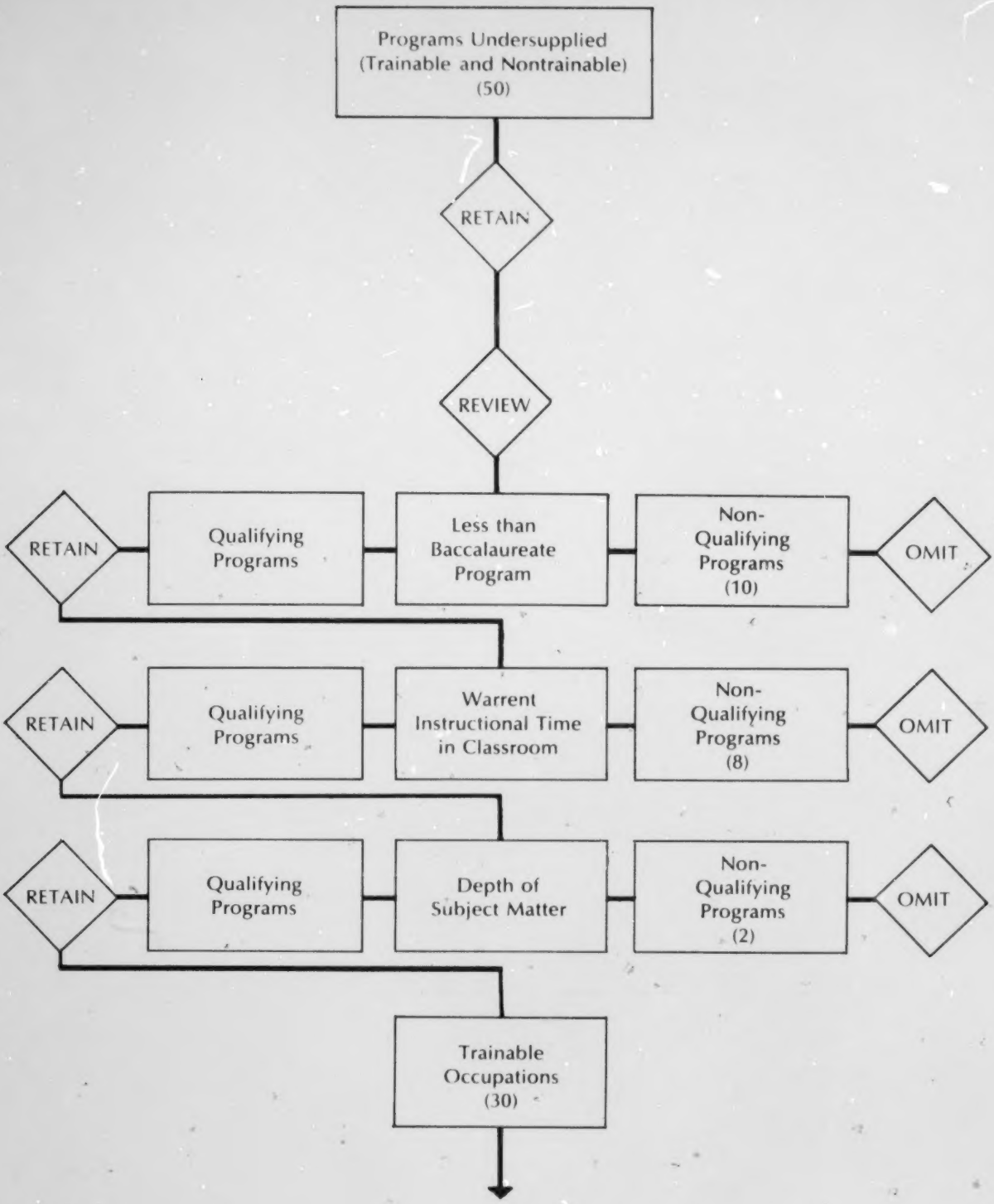


FIGURE 3. STAGE IV

the training for the occupational group would not warrant more than a minimal amount of time in the classroom. In the latter example, mechanical engineer is a professional occupation, and therefore not an occupation typically trained for at the community college. If, however, the occupational group had been for mechanical engineer technician, the program group would have met the criteria of less than baccalaureate degree and therefore continue to be considered for program implementation since technician level programs are generally trained for in community colleges in Oregon.

Stage V

Stage V, Determining Employer Hiring Practices, discloses that ten additional occupational program groups were eliminated from further consideration after the program planner examined the criteria to be met for this step. This reduced the 30 remaining occupational groups identified in Stage IV to 20. The reduction was the direct result of the program planner reviewing the hiring practices of employers known to hire qualified graduates from these programs. Input was received from carefully selected program advisory committees and appropriate program specialists at the Department of Education. In this instance, the planner noted that ten occupational program groups should not be offered at the community college level because (a) three were apprenticeable occupations which should be trained for by the local apprenticeship councils, (b) five were typically filled from within employer organizations by formalized bidding process, and (c) two were traditionally filled through on-the-job training. (See Figure 4.)

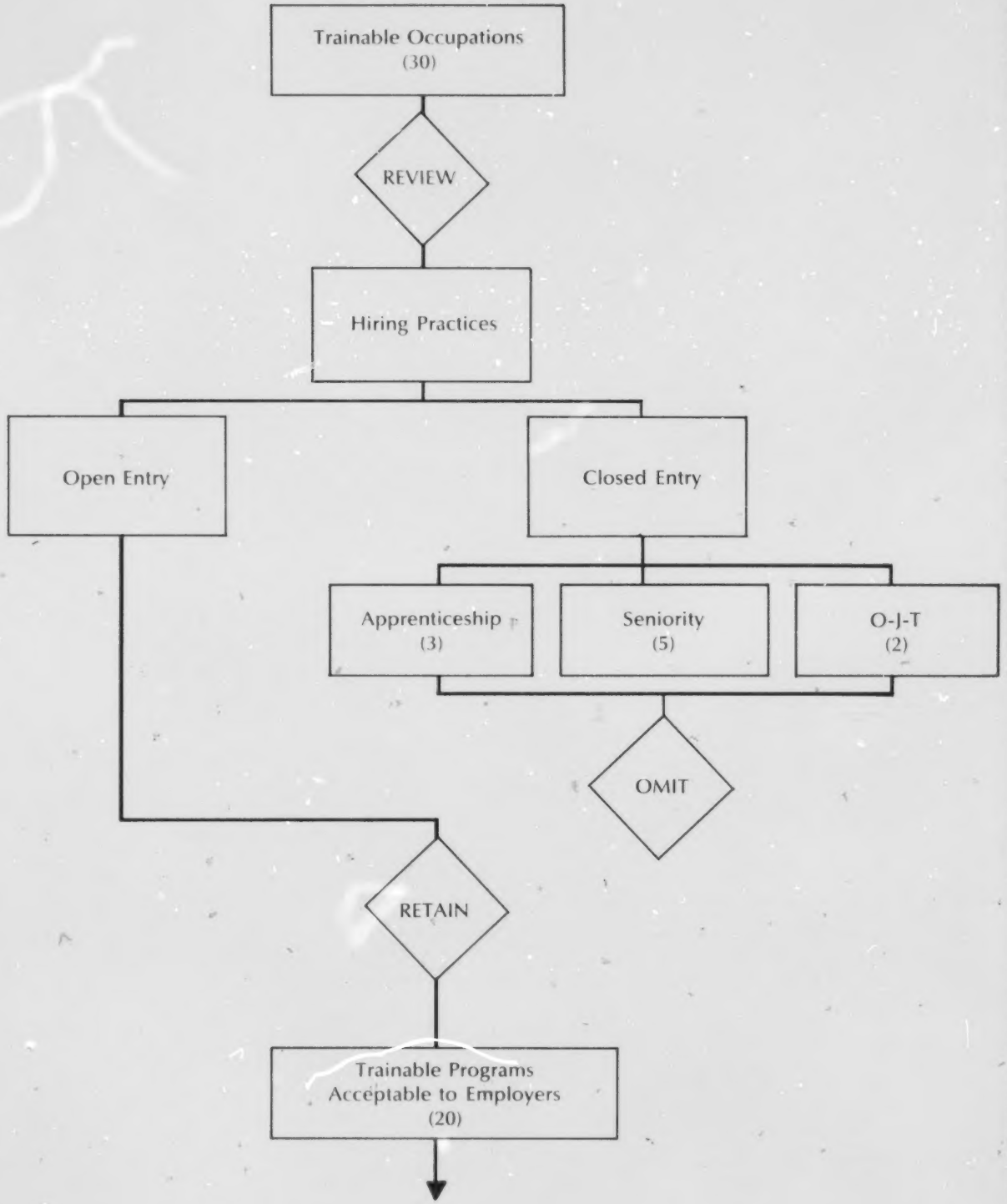


FIGURE 4. STAGE V

The three apprenticeable program groups assumed in this model were carpenter, plumber, and millwright. The five occupational groups typically filled from within the organizations were common to the pulp and paper and sawmill industries and were open only to junior workers who had acquired some degree of seniority. These positions were screenman, cookerman, pulper, wet machine tender, and edgerman. The two program groups typically filled by on-the-job training were telephone line repairer and cannery worker.

By being aware of these conditions the program planner can better meet the needs of the students by encouraging community colleges to have the students enter either (a) formal apprenticeship programs or (b) entry-level positions in the occupational group and industry of their choice. In either instance, the individual can better learn the necessary skills on the job rather than in the formalized classroom setting.

Stage VI

In the sixth stage (see Figure 5) other critical elements need to be examined. These may include such concerns as urgency of need for the program, adverse impact on other segments of education, fiscal impact, and student demand. The review of these items resulted in the reduction of ten additional program groups, leaving only ten other such programs for final recommendation and subsequent implementation. Of the ten programs eliminated, five were considered not urgent because they were only slightly undersupplied and because it was determined that existing programs could increase their present output of graduates to meet the present demand; two were eliminated bcause of expected adverse impact on other segments of the educational community; two

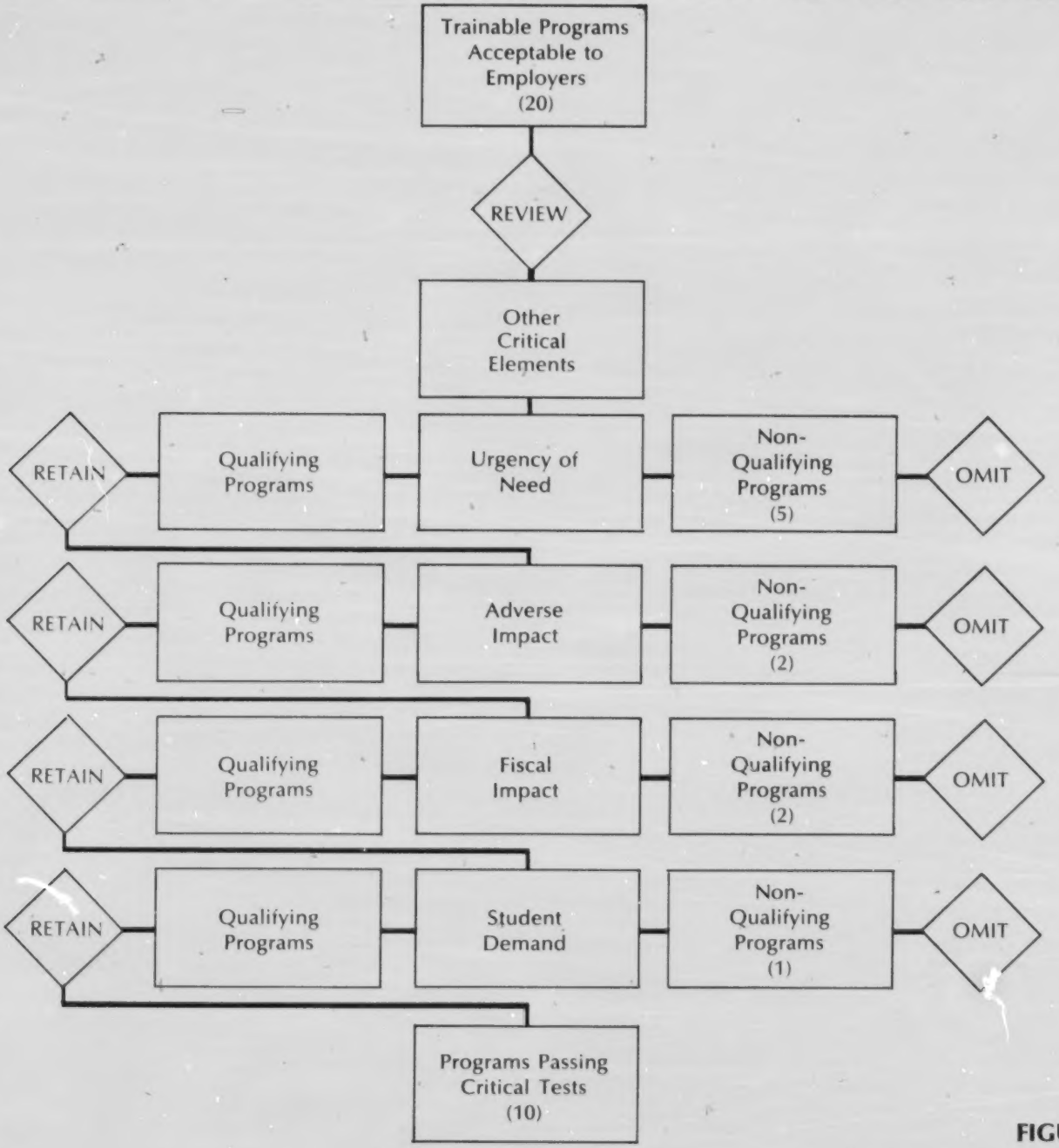


FIGURE 5. STAGE VI

programs were eliminated because of fiscal constraints; and one was no longer considered because of limited student demand.

When evaluating undersupply the program planner must decide how much undersupply is acceptable for a program to remain in consideration. In the example, it is assumed that all occupational groups needing two or more programs in the state in the year under study will continue to be considered. Three program groups did not meet this criterion. The remaining two programs dropped were determined to have the capacity to increase their present enrollment and numbers of graduates to meet the community colleges' share of the labor market demand.

The two programs eliminated because of their fiscal impact were confronted with excessive construction and finance charges and legislative restrictions of new construction. The two programs eliminated because of adverse impact on other segments of education were no longer considered because current graduates from four-year college programs were presently filling the positions. Although the two-year colleges are the most logical to train for the two programs eliminated, the four-year college graduates were currently filling these positions because of the present economic phenomena of high unemployment. As the economy becomes better able to absorb these individuals into the professional occupations for which they were trained, the program planner may again need to consider the two programs eliminated.

In this model, limited student demand also caused the planner not to recommend one program in particular. Since this program did not appeal to students in a formalized training setting, it was no longer considered for further

recommendation. Oddly enough, high student demand should not by itself result in the recommendation of a program without other factors being considered. Many of these have already been discussed. However, as an example, the two-year community college nursing program (ADN) may have a high demand, yet be faced with a reasonably balanced demand and supply ratio. In this instance, the planner probably should not consider recommending another nursing program unless other justification should be discovered.

Stage VII

The ten programs remaining after each of the critical elements have been reviewed are then recommended for implementation in the seventh and last stage of the program planning process (see Figure 6).

Prior to implementation, the program planner must first decide how best to allocate the ten programs. The most practical approach is to implement the ten programs in those community colleges representing the labor market having the largest or most urgent need. If programs already exist in these areas, the planner should next select from those other areas that come closest to balancing the specific program about the state. In doing so the planner should be careful that a specific program once allocated is not completely foreign to the local labor market, e.g., legal assistant in a rural agriculture-oriented community college or seed technology in a heavy industry-oriented metropolitan community college.

The program planner at the state level should always try to insure a fair allocation of programs about the state, since the student population in Oregon community colleges continues to be highly mobile.

FIGURE 6. STAGE VII

Once the decision has been made to implement a new program, curriculum specialists at the Department of Education may need to be made aware of the proposed change. Should the program already exist in the state no modifications may be needed, although ideally this would be a good time to consider them. If, however, no such program is presently available throughout the state, the curriculum development model on the following pages will prove to be very valuable. This process will also provide an excellent means to update existing secondary and community college vocational programs.

CONCLUSION

The foregoing examples in this state level program planning model are elements of major concern that planners should consider regardless of the order they are examined with this model or the model of their own choosing. In this model, manpower demand and supply take the lead in beginning to help project occupational programs. In other models, the priority may be given to student demand, existing facilities, or some other priority. But in all cases, most of the concerns discussed in this model must eventually be given careful consideration.

In order to meet the requirements of most federal legislation this model has been developed principally with the thought to give major visability to labor market needs.

VOCATIONAL CURRICULUM DEVELOPMENT PROCESS

This portion of the project will concern itself with various uses of acquiring and utilizing data in respect to decisions related to curriculum development efforts at the state level. It was decided that rather than to attack the problem from the point of merely using data and the relationship of data to curriculum development activities at the state level, we approach the problem of designing a model (process) for curriculum development at the state level and during the design stages analyze the needed and existing data necessary to make appropriate curriculum decisions.

A. Nature of the Process. To be fully appreciated in a curriculum development context, the term "process" needs to be operationally defined. The term PROCESS means a cycle of events established to accomplish desired results or ends; thus, it is "means to ends." Process is cyclical; its steps are recurring. It is perpetual, continuous, dynamic. Some steps are sequential; certain things done before another step is undertaken. However, many activities in a process can be conducted simultaneously; hence, flexibility is a necessary ingredient.

Systems View. People from various educational disciplines have formulated many different processes for curriculum development. Good curriculums are the result of dedicated and intelligent work conducted on a continuing basis. There is no official, standardized procedure for curriculum development. Probably the systems view (Banathy 1968), or systems approach (Bushnell 1970) (Glaser 1969), offers more than any

other single concept with respect to a way of dealing with complex problems and their changing relationships. The systems approach in curriculum development requires statements of performance objectives, continuous assessment of performance--the exercise of quality control--and adjustment for improvement; hence, the relationship to "cyclical" process. Banathy indicates that the systems approach offers "a decision-making structure and a set of decision-making strategies." Relevant data is needed to assist in making those decisions. He further indicates that the systems approach is not necessarily new, that it is "common sense by design." To a certain extent, this describes the process used by the Oregon Department of Education (ODE) Curriculum Development Unit.

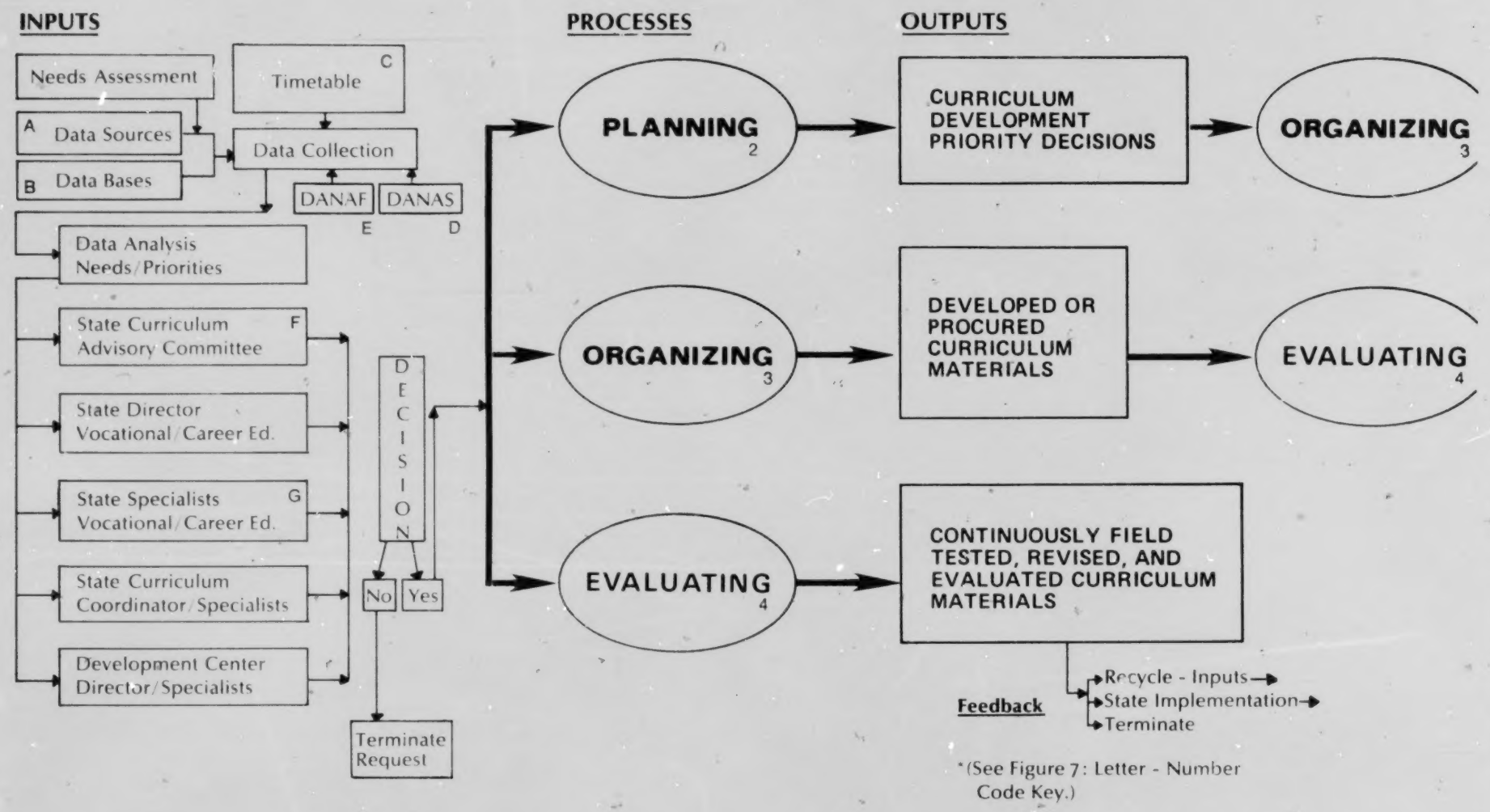
B. Steps in the Process. Embodied implicitly in the following process, which the ODE Curriculum Development Unit is beginning to implement, are many of the aspects of the systems approach. Barlow defines the curriculum as "the sum total of the learning experiences for which the school has responsibility." Furthermore, he states that "to plan a curriculum means to select, arrange, and sequence these experiences, through the joint decisions of teachers and learners, so that successful learning results." We believe state departments of education have the responsibility to establish the general direction of viable relevant curricula in all schools and to assure that quality education occurs. However, the state agency must work through local school administrators and teachers if quality education is to occur.

A SYSTEMS APPROACH

A systems approach overview for the Curriculum Development Process of the Oregon Department of Vocational Education is shown in Figure 7. Although other approaches may be suitable, a three-part operation of inputs, the processes of planning, organizing, and evaluating, and outputs is used in describing the Data Application Needs Assessment System (DANAS) approach for curriculum development and coordination by the Oregon Department of Education. The various inputs involved with curriculum development needs assessment are shown as providing data inputs to the planning, organizing, and evaluating processes. The planning process requires the specification of organizational objectives, as well as searching for and evaluating alternative means to achieve these objectives. Organizing involves staffing and implementation of the means selected for achieving the objectives. Evaluating is auditing the means and subsequent products to assure its compliance with the plan (Young 1966). The outputs are described as final decisions and end products resulting from the application of each process. Feedback of the output, when compared with planned objectives, is provided for subsequent review and adjustment. In the following sections of this approach, each process will be discussed more thoroughly in terms of the specific tasks used in its application.

DATA APPLICATIONS NEEDS ASSESSMENT SYSTEM
CURRICULUM DEVELOPMENT PROCESS

[DANAS]



*(See Figure 7: Letter - Number Code Key.)

FIGURE 7: A MANAGERIAL SYSTEM FOR CURRICULUM MATERIAL DEVELOPMENT, INSTALLATION, AND EVALUATION*

FIGURE 7. LETTER-NUMBER CODE KEY

Letter

A. Data Sources: Appendix 1-C, page 61

B. Data Bases: DANAF, Appendix 1-D, Items No. 10, 12, 13, 25, pages 62, 63, and 67

C. Timetable: DANAF, Appendix 1-D, Item No. 19, page 65

D. DANAS: Data Application Needs Assessment System, page 61

E. DANAF: Appendix 1-D, page 62

F. State Curriculum Advisory Committee: Appendix 1-E, page 68

G. State Specialists, Vocational/Career Education: Appendix 1-F, page 69

Number

2. Planning 2: Figure 8, page 34

3. Organizing 3: Figure 9, page 40

4. Evaluating 4: Figure10, page 45

DANAS--DATA APPLICATION NEEDS ASSESSMENT SYSTEM

CURRICULUM DEVELOPMENT

Data System Design (Control Procedures)

The rationale for development of the Data Application Needs Assessment System for curriculum development (DANAS) is shown in the following fourteen (14) elements that will be incorporated to meet the two (2) basic goals. These elements can be viewed as control procedures for DANAS.

1. Identify the needs of the educational system for data about curriculum development (immediate, short-range, long-range).
2. Determine the objectives of the data system for curriculum development (immediate, short-range, long-range).
3. Plan and implement a procedural program for collecting, processing, interpreting, storing, and disseminating data about the needs of curriculum development.
4. Make certain that data requests are necessary, reasonable, and timely, and that the data can flow from local records to reports needed at the state level for decisions concerning curriculum development.
5. Select items that are needed to meet data needs for decision-making on curriculum development.
6. Incorporate the data items into appropriate information collection forms.
7. Gain the cooperation of all concerned in order to ensure total input of data to make decisions concerning curriculum development.

8. Provide whatever assistance is required by suppliers of data in carrying out their responsibilities to identify, gather, and report data about curriculum development needs.
9. Ensure data accuracy by helping suppliers understand the purposes and importance of the data for curriculum development.
10. Utilize modern and appropriate methods, devices, and procedures for processing the data on curriculum development.
11. Keep records up to date concerning curriculum development data.
12. Strive for promptness in forwarding required data to the state level, making possible early compilation and increasing timeliness and usefulness in curriculum development.
13. Implement the data system for decision-making concerning curriculum development.
14. Evaluate the data system for curriculum development for adequacy, effectiveness, and improvement.

Goals: Data Application--Curriculum Development Process

Level I: Communicate relevant data to appropriate decision-maker(s) about curriculum development needs.

Level II: Gather appropriate data to make decisions concerning curriculum development priorities at the state level.

INPUTS

In order to make decisions on statewide priorities for curriculum development, informational data needs to be obtained from the various data sources as inputs into the DANAS curriculum development process. (See Appendix 1-C for a data sources listing, page 61.) To facilitate the gathering of the requisite data from the many sources, a Data Application Needs Assessment Form (DANAF) is to be utilized. (See Appendix 1-D, page 62.) The data gathered from the various sources will be analyzed to provide information for the State Curriculum Advisory Committee to make decisions in relation to needs and priorities. Once the needs and priorities are specified, then the next phases of the curriculum development process will be implemented: processes-planning, organizing, and/or evaluating.

PROCESSES

A. The Planning Process. The primary function of the State Curriculum Coordinator in the curriculum development process is forming and directing the activities of the Curriculum Advisory Committee. The Committee is established to give input concerning curriculum development needs of Oregon's vocational and career education programs, based on data inputs of sources, bases, collection, and analysis. Members of the committee consist of representatives from local educational agencies, state supervisor staff, teacher education personnel, business and labor leaders, and curriculum material developers. (See Appendix 1-E, page 68.) The committee serves in an advisory role to ascertain the curriculum material development priorities for vocational and career education programs within the state. Other functions performed are:

1. Formulating policies for curriculum material development decisions.
2. Providing a communication link among various organizations comprising the committee.
3. Receiving data input information and concerns from various individuals, organizations, and interest groups.
4. Providing assistance in reviewing and reacting to curriculum materials under development.
5. Developing a master plan to give direction to curriculum materials development and renewal activities. (Feyereisen, Florino, and Nowak, 1970).

A flow chart of the tasks involved in the planning process is shown in Figure 8. The formation of the curriculum advisory committee is the initial step in the entire process. The first task of the committee is to consider policies and guidelines for making decisions about curriculum materials that are needed within the state. These policies involve determining: (1) the duties of the committee, (2) procedures for conducting the meetings, and (3) criteria for making decisions.

As the curriculum committee is being formed, the coordinator should be identifying the status of curriculum materials for current vocational and career education programs by utilizing the DANAF approach. This information can be obtained with the assistance of the state specialists (supervisors), teacher educators, and local directors of vocational education. In Oregon, assistance and input is also obtained through regional career education coordinators. After determining the current status of curriculum development needs, a projected list of needed materials is prepared which could ideally implement present and future programs. At this point it is critical that consultation be made with the State Department Manpower Analyst or whoever functions in this capacity. As curriculum development needs are being identified with respect to manpower needs, funding sources and available financial support must be determined in order to develop or procure the needed materials. These sources would range from allocated federal funds to private foundation grants.

After the information concerning curricula needs and funding is obtained, the list of needs is submitted to the curriculum advisory committee for their review. The State Curriculum Advisory Committee

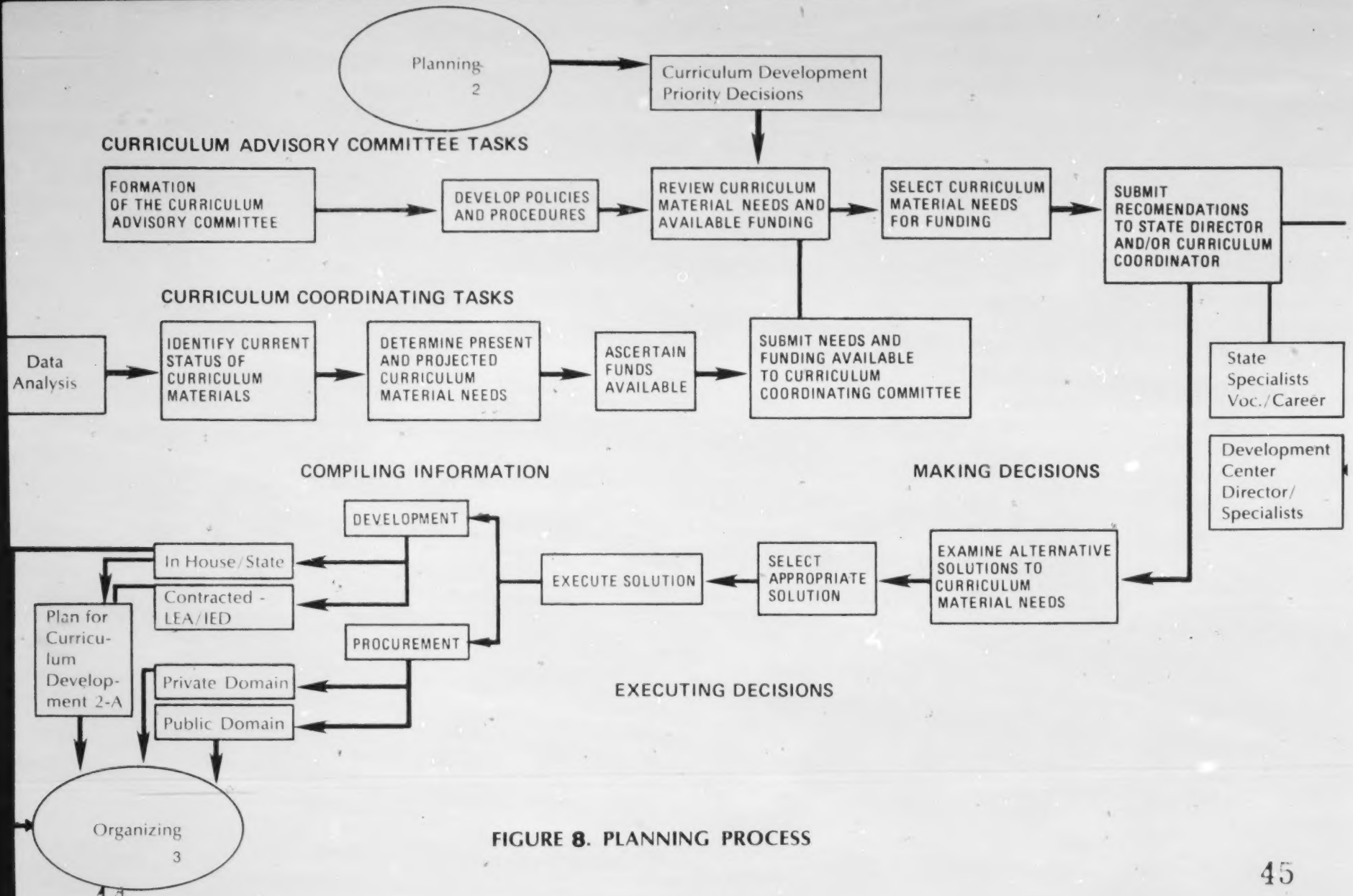


FIGURE 8. PLANNING PROCESS

reviews the list and assesses priorities in terms of overall program needs and recommends levels of funding for each priority. The specification of curriculum development priorities is then submitted to the state director and used by the curriculum coordinator in examining alternate solutions to fulfill the needs. The curriculum coordinator examines these needs in terms of available data and materials. The curriculum coordinator will consider the needs with respect to: (1) the availability of commercially prepared materials, (2) development of similar materials by another state or federally funded project, and (3) capability of development within the state department of vocational education. After alternatives have been considered and a solution selected, the curriculum coordinator would execute the decision through: (1) a procurement procedure or (2) developing the curriculum material within-house or (3) subcontracting to other agencies.

If the decision is made to develop the curriculum materials through (1) developing in-house at the state level or (2) subcontracting through other agencies, the next level of the Planning Process, 8-A, will be implemented. This level is described through the model phases 8-A, 8-B, and 8-C. These phases show the development of the actual curriculum materials to meet the identified needs, through the instructional strategy decisions and the relationship of the actual subject matter. When these phrases have been completed, the next step in the process, organizing, is initiated.

In considering procurement of data, whether this data be in the form of occupational task analyses, competencies, learner modules or available software, the coordinator would consider searches through

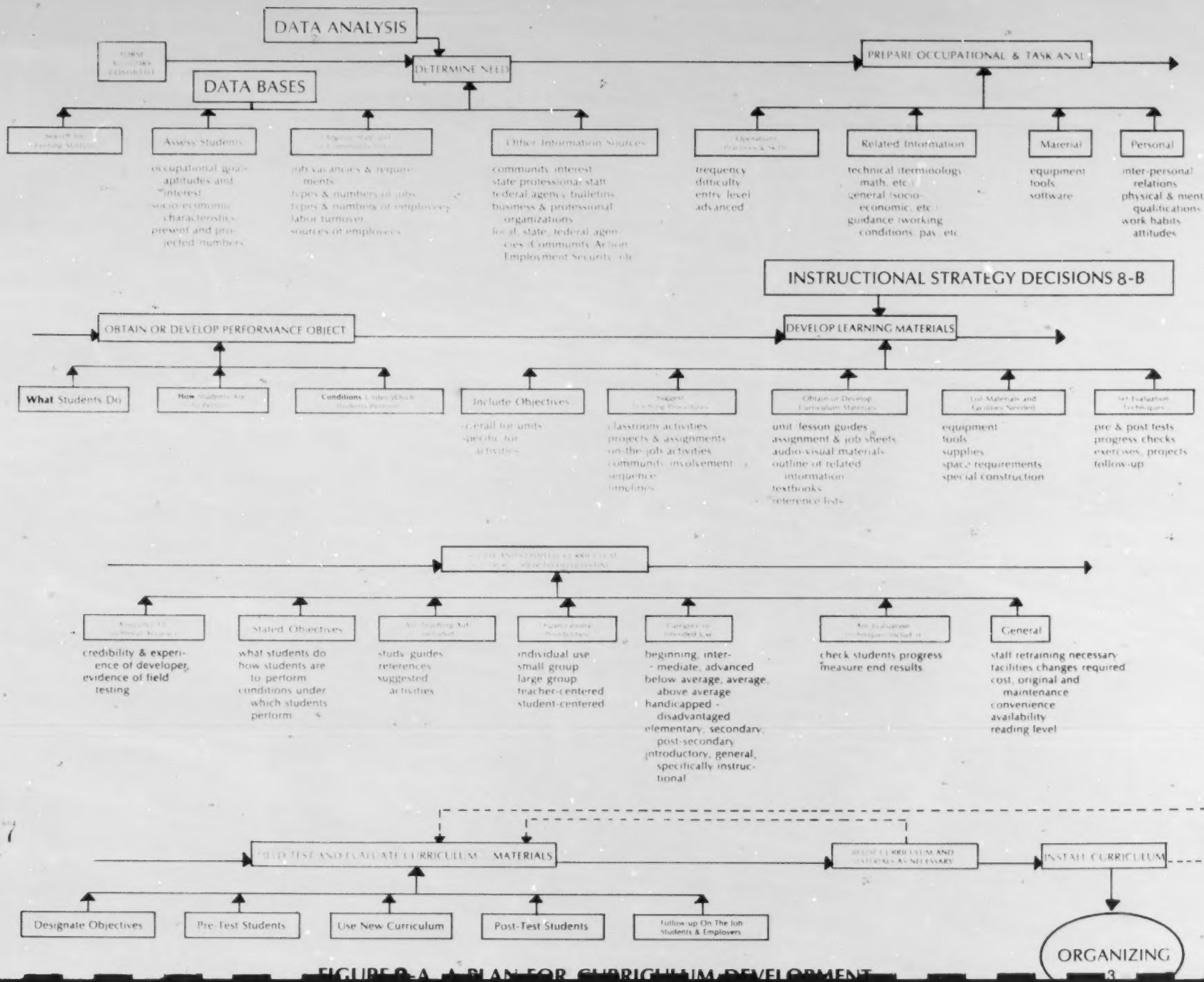


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FIGURE 8-A. A PLAN FOR CURRICULUM DEVELOPMENT

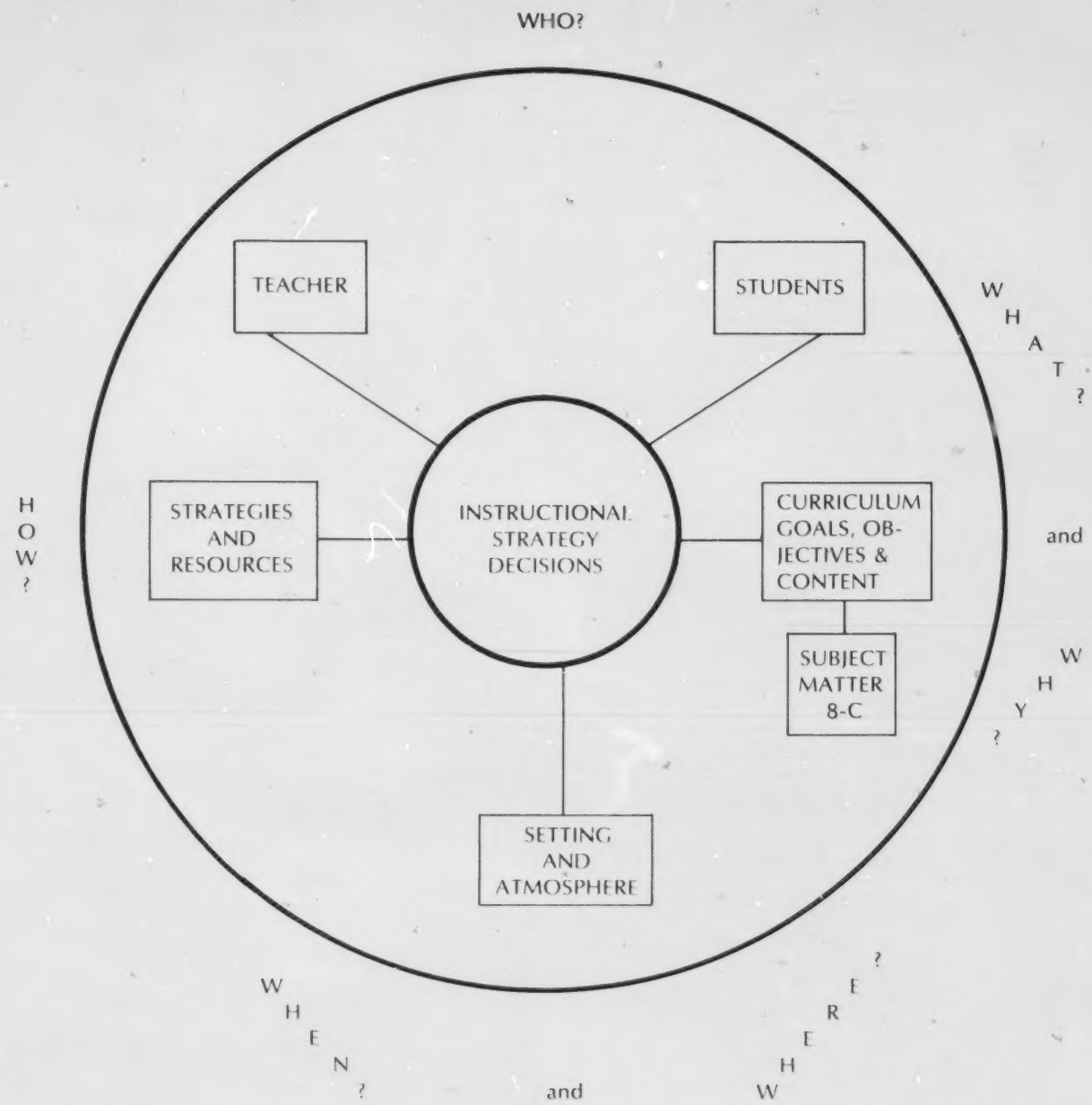

FIGURE 8-B. INSTRUCTIONAL STRATEGY DECISION-MAKING

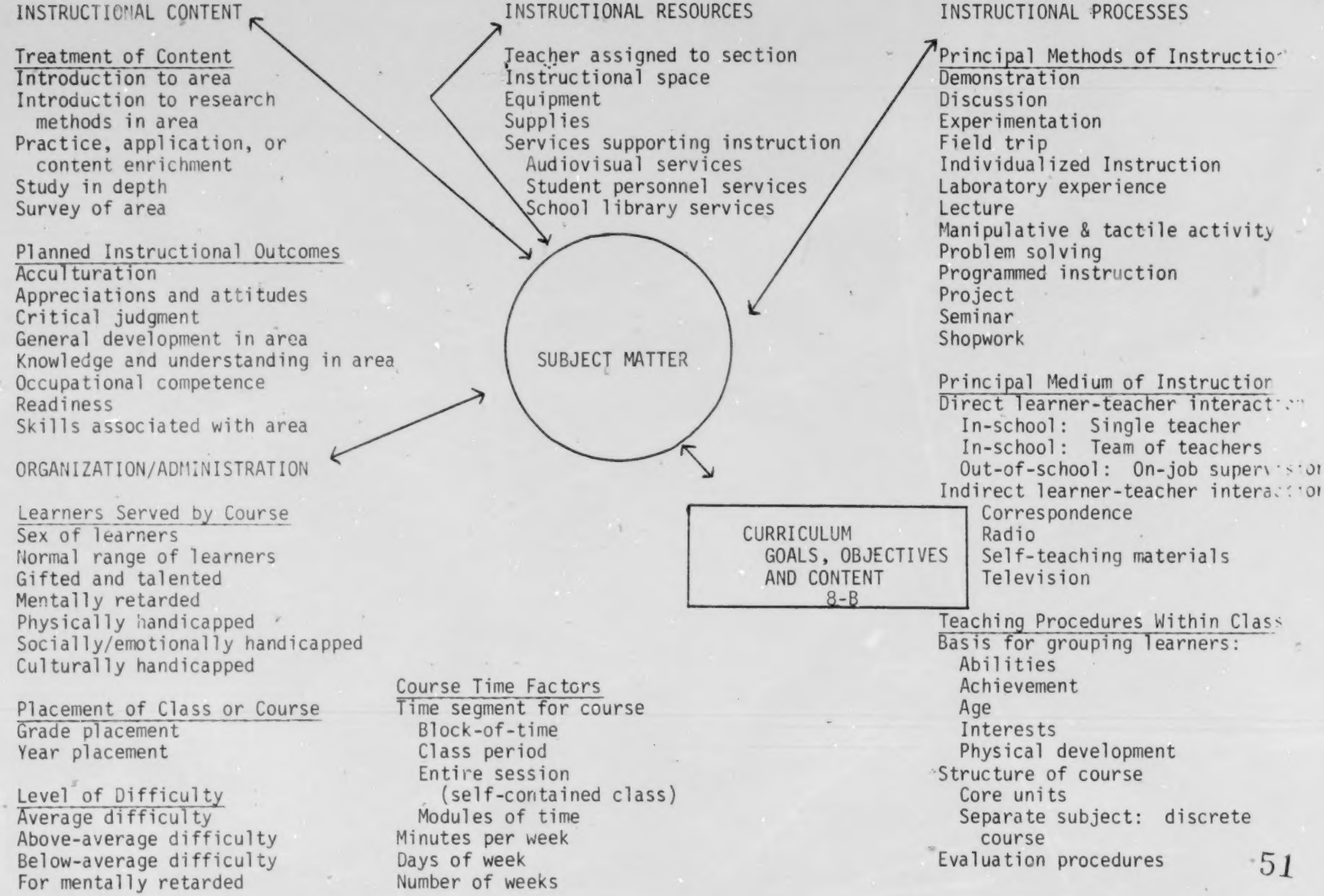

FIGURE 8-C. INTERRELATIONSHIPS OF SUBJECT MATTER WITH OTHER SELECTED ASPECTS OF CURRICULUM AND INSTRUCTION

such sources as the National Network for Curriculum Coordination in Vocational and Technical Education (NNCC) and the Ohio Task Inventory Exchange (TIE). At present, the Oregon Department of Education has approximately 38 occupational/task analyses available in nine occupational areas. A data bank of competencies in six areas are also available. Occupational analyses are planned in an additional 55 key occupations in Oregon. Over 1,000 different learner modules are available to assist teachers in implementing individualized competency based education.

B. The Organizing Process. After the planning phase has been completed the decisions made will need to be implemented and directed by the curriculum coordinator. In many instances, the coordinator will need to become a "change agent" (Havelock 1973) in facilitating the adoption of innovative curriculum materials by local school districts. The development and installation of individualized instructional modules is a current example. An assumption is made in this discussion that most curriculum improvements will be made using materials that are innovative and represent something new to teachers. Therefore, the organizing process will require tasks that deal with educational change. A model proposed by Guba and Clark (1965) appears to be an appropriate one for this purpose. The Guba and Clark model suggests that four major processes or strategies are necessary for change in education. These strategies are research, development, diffusion, and adoption. The flow chart, shown in Figure 9, advocates two of the four strategies and presents specific tasks used by a curriculum coordinator in linking various organizations concerned with developing, disseminating, and adopting innovative curriculum materials.

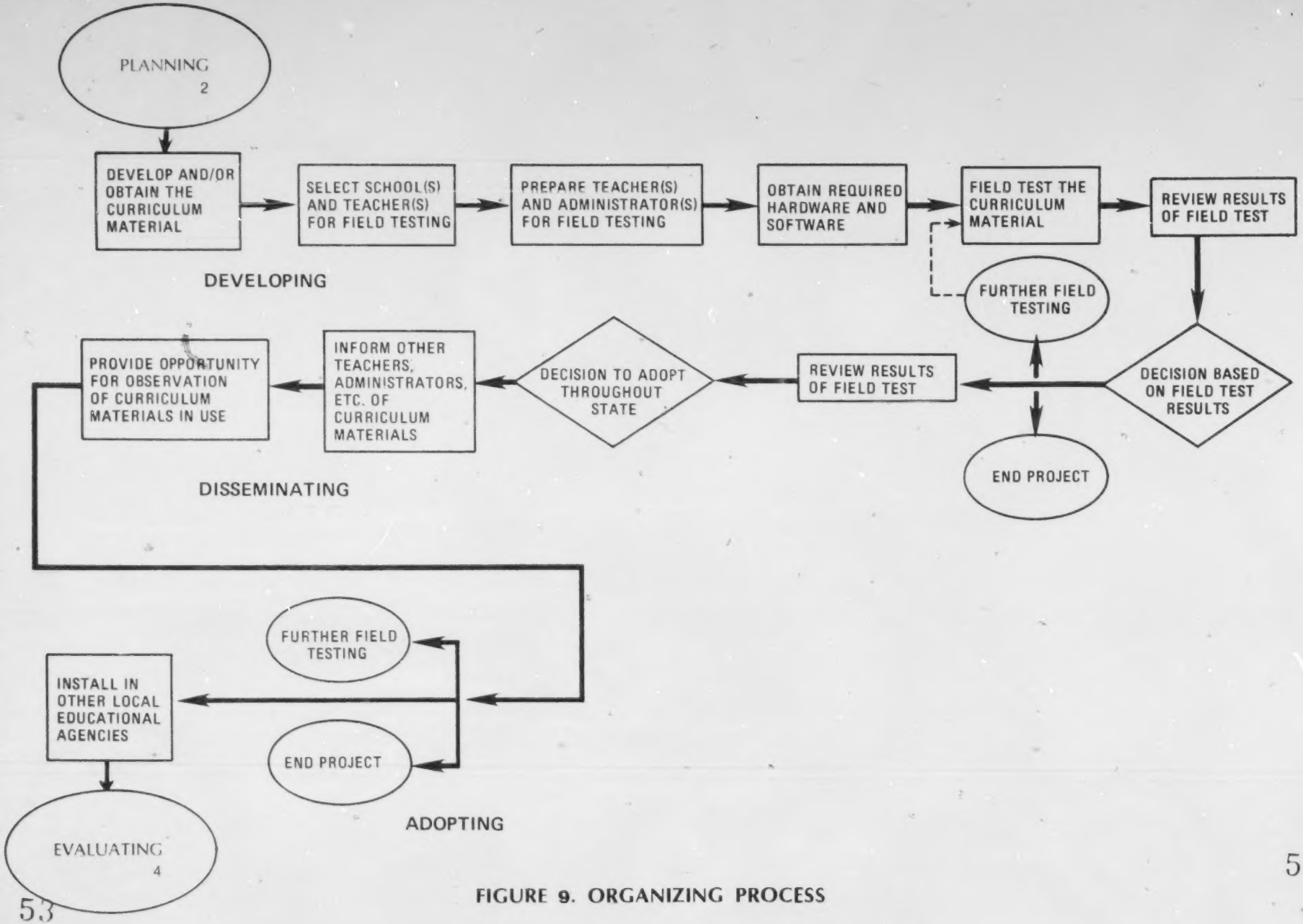
PLANNING
2
DEVELOP AND/OR OBTAIN THE CURRICULUM MATERIAL
SELECT SCHOOL(S) AND TEACHER(S) FOR FIELD TESTING
PREPARE TEACHER(S) AND ADMINISTRATOR(S) FOR FIELD TESTING
OBTAIN REQUIRED HARDWARE AND SOFTWARE
FIELD TEST THE CURRICULUM MATERIAL
REVIEW RESULTS OF FIELD TEST
DEVELOPING
FURTHER FIELD TESTING
DECISION BASED ON FIELD TEST RESULTS
REVIEW RESULTS OF FIELD TEST
DECISION TO ADOPT THROUGHOUT STATE
INFORM OTHER TEACHERS, ADMINISTRATORS, ETC. OF CURRICULUM MATERIALS
PROVIDE OPPORTUNITY FOR OBSERVATION OF CURRICULUM MATERIALS IN USE
END PROJECT
DISSEMINATING
FURTHER FIELD TESTING
INSTALL IN OTHER LOCAL EDUCATIONAL AGENCIES
END PROJECT
ADOPTING
EVALUATING
4

FIGURE 9. ORGANIZING PROCESS

As the curriculum material is being developed or obtained, liaison between the curriculum producers and the state department staff, and teacher educators, must be maintained by the coordinator. This liaison could involve periodical review of curriculum materials under development by state supervisory staff, teachers, and teacher educators. It is important at this point that an opportunity be given for all individuals and groups who will be preparing and supervising teachers using the completed curriculum material to review and make suggestions concerning its final form and/or proposed use. Other forms of liaison would include administrative and support services such as monitoring fiscal control of the project and providing information about similar efforts to the developers.

During the development or procurement of the curriculum materials, decisions must be made about the selection of a school for field testing purposes. After the school has been selected, the teachers and administrators must be prepared to use the material in the intended manner. Various problems must be anticipated and procedures for evaluating them should be discussed in the preparation meetings. These problems may range from scheduling students who will use the material to methods teachers use in reporting their reactions and recommendations to the curriculum developers. A critical task of the coordinator, in cooperation with the curriculum developer and local educational agency, is the procurement of the hardware (projectors, tape recorders, etc.) and software (filmstrips, printed material, etc.) needed to implement the developed curriculum material. Arrangements must be made to reproduce and deliver sufficient quantities of the needed curriculum material in time for the teachers to

review and organize it properly. The local educational agency must have specifications for hardware and software from the curriculum developers in order to purchase it from available sources in time to begin the field testing. The curriculum coordinator will play an important role in linking the procurement of the required instructional resources with the teachers and administrators.

The curriculum material would be revised and modified ideally during this time (or closest available time--such as the next summer) using the inputs of students, teachers, and administrators at the field test site. Upon completion of the field testing phase, the results should be reviewed by the curriculum advisory committee, or other designated group, and decisions made concerning future directions. It is possible that additional field testing is needed before disseminating the results. It may not be feasible to continue the project due to poor results or a low yield of return for the investment made in the project.

Hopefully, the results will be favorable and additional actions taken to continue the dissemination effort. It is important to realize that the development and field testing phase may require at least two years depending upon the amount and complexity of the needed curriculum development.

If the results are favorable, dissemination of the curriculum materials should be made to teachers, administrators, teacher educators, and state staff. Several approaches may be utilized

in this endeavor including presentations at meetings of professional organizations, scheduled state department staff meetings, and in-service teacher preparation programs. In addition to the dissemination process, opportunities should be given for interested groups and individuals to observe the curriculum materials in operation at the field test site. The Oregon Department of Education has contracted with Continuing Education Publications, which is another state agency, to print, warehouse, and disseminate curriculum materials through sales to schools in Oregon as well as other states.

Procedures similar to those used in field testing will need to be followed in installing the curriculum materials with additional schools. Teachers must be prepared, instructional materials obtained, and evaluation procedures should be finalized. During this phase, a rigorous evaluation of the curriculum materials should be accomplished by comparing the performance of the material against prestated standards. The evaluation phase will be discussed in greater detail in the next section. As the curriculum materials are installed and used by teachers and students, evaluative data is collected and analyzed. The results will provide the information needed to make decisions regarding further field testing or installing in other school systems throughout the state.

C. The Evaluating Process. The purpose of evaluation in the managerial system is to regulate and maintain the system in achieving its goals and objectives. It is that phase of the system which monitors performance and provides feedback information which can be used in adjusting the means and ends (Kast and Rosenzweig 1970). Ultimately,

the evaluation process must insure that the output (curriculum materials) will satisfy the environmental conditions (needs of society) of the system. There are several major tasks involved in the evaluation process as shown in Figure 10.

Initially, the curriculum coordinator, in cooperation with others, must develop evaluative criteria and performance specifications that will be used in determining if the prestated goals and objectives have been achieved. For example, one of the criteria used by the curriculum adivsory committee in determining priorities may be the appropriateness of the material for present and future occupational needs. The evaluative criteria in this case would be the content validity of the material with respect to present and future occupational requirements. In order to collect information about content validity, the curriculum coordinator could submit the material to an ad hoc occupational advisory committee for their review and recommendations. After reviewing their recommendations, the curriculum coordinator would initiate feedback to the appropriate organization or group. In the case being presented, this could be the curriculum advisory committee or the curriculum developers. At this point, adjustments and modifications are made to the curriculum material and it is again installed in the local educational agency. Additional evaluative criteria and methods of collecting information which is provided to the appropriate group for their adjustment are shown in Figure 11.

Although there are many factors involved in the evaluation process, the list is suggestive of several criteria that may be used. Many of these activities would be conducted within the state department by

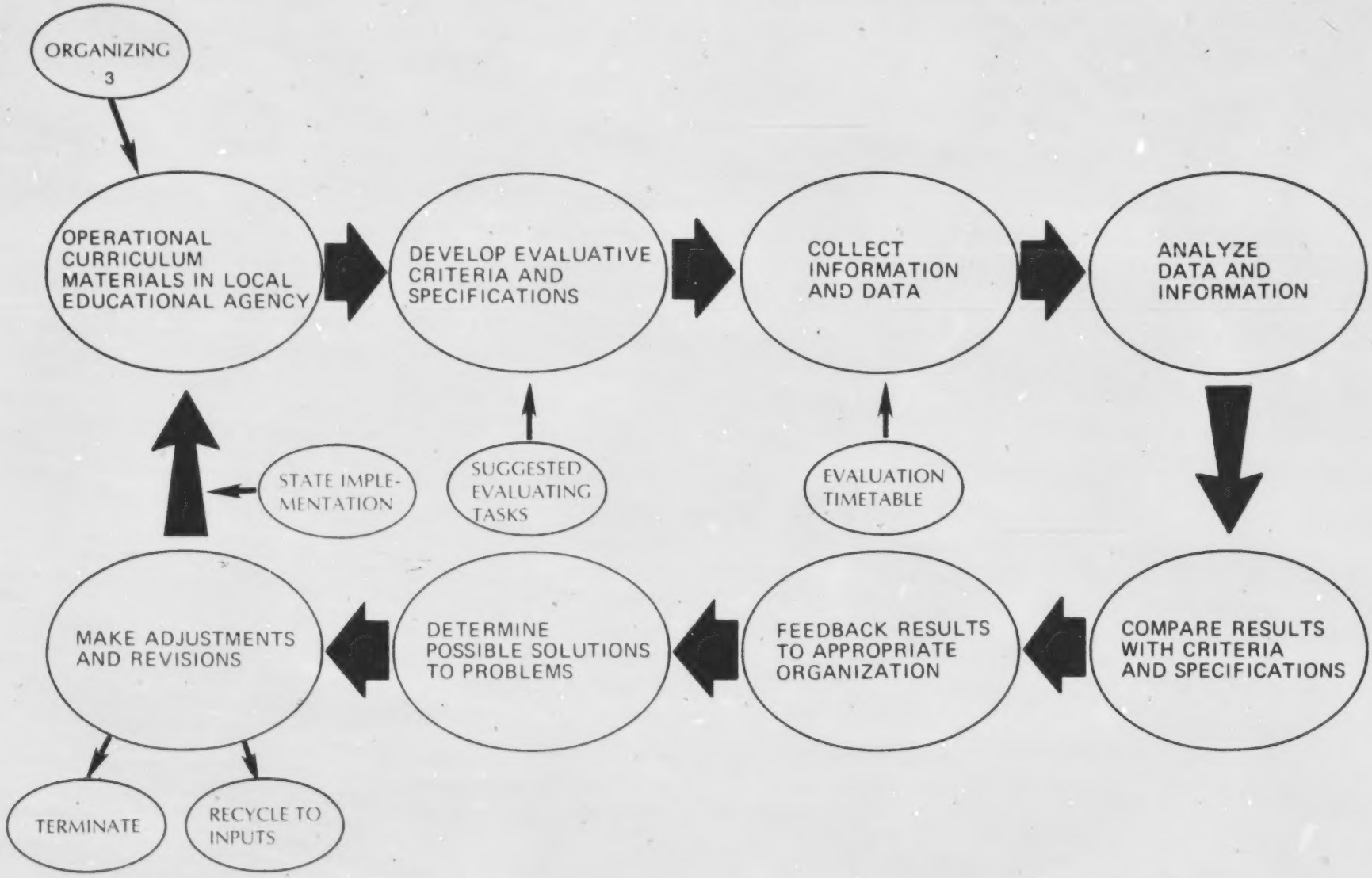

FIGURE 10. EVALUATING PROCESS

CRITERIA	METHOD OF OBTAINING INFORMATION	FEEDBACK	ADJUSTMENT
Do curriculum materials have content validity in terms of occupational requirements?	Periodic examination of curriculum material by ad hoc occupational advisory committees.	Curriculum advisory committee and/or curriculum developers.	Fund project to extensively revise curriculum material or make minor revisions and reprint.
Are curriculum materials being used effectively and efficiently by teachers?	Visit programs using curriculum material to observe teachers and make anecdotal records of observations.	Teacher education institutions and/or state supervisory staff.	Modify methods being taught to preservice teachers. Assist supervisory staff in modifying in-service teacher behavior.
Do curriculum development methods produce quality materials with least cost and time?	Conduct cost/effectiveness studies to determine cost of curriculum materials developed by different approaches.	State director and curriculum coordinator.	Select methods of organization that produce quality materials with least cost and time.
Are curriculum materials producing desired student behaviors?	Conduct controlled studies to determine if and how students are achieving objectives.	Curriculum developers.	Redevelop curriculum material until it meets acceptable standard of performance.

FIGURE 11. SUGGESTED EVALUATING TASKS

the curriculum coordinator while others would be formally contracted projects to obtain the needed information for making decisions. The primary concern is to provide feedback to the appropriate group and coordinate efforts in making adjustments to the development, installation, and evaluation of curriculum material on an ongoing, continuous basis. Presently, Oregon is in the process of developing more extensive procedures for field testing and evaluating curriculum materials.

In conclusion, the role of the state department of vocational education in improving curriculum for local educational agencies is a complex and time consuming enterprise. The organizational environment requires the coordination and integration of many administrative levels within numerous organizations and institutions. The curriculum development processes will require individuals who are capable of working well with data and many persons in various organizations and areas of vocational education. The proposed curriculum model that was described to control and direct the various human, financial, and material resources will of necessity be changed, modified, and adapted to existing state department policies and personnel. However, it is legitimate to initially explore optimums as the realities of any given situation will compromise most of us soon enough.

APPENDIXES

APPENDIX 1-A

USOE PROGRAM GROUPS INCLUDED IN OREGON'S FORMAL AND INFORMAL CLUSTERS

Cluster	USOE Code	USOE Instructional Program
Agriculture	01.010000	Agriculture Production
	01.010100	Animal Science
	01.010200	Plant Science
	01.020000	Agricultural Supplies/ Service
	01.020100	Agricultural Chemicals
	01.020200	Feeds
	01.030100	Agricultural Power and Machinery
	000H0108*	Ornamental Horticulture
	01.060000	Agricultural Resources
Marketing	04.010000	Advertising Services
	04.020000	Apparel and Accesories
	04.040000	Finance and Credit
	04.060000	Food Distribution
	04.080000	General Merchandise
	04.120000	Industrial Marketing
	04.130000	Insurance
	04.170000	Real Estate
	04.990000	Distributive Education, Other
	14.050300	Shipping and Receiving Clerks
	14.050400	Stock and Inventory Clerks
	14.059900	Materials Support Occupations, Other
Health	000H0409	Pharmacology, Human and Animal
	000H1204	Dentist
	000H1207	Practitioner
	000H1209	Optometry
	000H1220	Speech Therapist
	000H1221	Chiropractor
	000H1306	Foods and Nutrition
	07.010100	Dental Assistant
	07.010200	Dental Hygiene
	07.010300	Dental Lab Technology
	07.020100	Cytology
	07.020200	Histology
	07.020300	Medical Lab Assistant
	07.029900	Medical Lab Technology, Other
	07.030100	Registered Nurse, Entry Level
	07.030200	Practical Nurse
	07.030300	Nursing Assistance
	07.030400	Psychiatric Aide
	07.030500	Surgical Technician
	07.040100	Occupational Therapy

* This is a HEGIS instructional program code developed by the U.S. Department of Health, Education, and Welfare, Office of Education for higher education programs. (HEGIS is an acronym for Higher Education General Information Survey.) In those instances where it is used in Oregon it is believed to be more appropriate than USOE instructional program codes.

Cluster	USOE Code	USOE Instructional Program
Health	07.040200	Physical Therapy
	07.040400	Orthotics
	07.049900	Rehabilitation, Other
	07.050100	Radiologic Technology
	07.050300	Nuclear Medical Technology
	07.080100	Mental Health Technician
	07.090000	Misc. Health Occupations Education
	07.090100	Electroencephalograph Technician
	07.090200	Electrocardiograph Technician
	07.090300	Inhalation Therapy
	07.090400	Medical Assistant
	07.090700	Medical Emergency Technician
	07.090900	Mortuary Science
	07.990000	Health Occupations Education, Other
Food Service	01.040100	Food Products
	01.040102	Dairy Products
	09.020300	Food Management, Production, and Services
	17.290000	Quantity Food Occupations
	17.290100	Baker
	17.290200	Cook/Chef
	17.290300	Meat Cutter
	17.290400	Waiter/Waitress
	17.299900	Quantity Food Occupations, Other
Accounting	14.010100	Accountants
	14.010200	Bookkeepers
	14.010400	Bookkeeping Machine Operators
Clerical	14.020100	Computer/Console Operators
	14.020200	Peripheral Equipment Operators
	14.020201	Keypunch Equipment Operators
	14.020300	Programmers
	14.020400	Systems Analysts
	14.030200	File Clerks
	14.030300	General Office Clerks
	14.039900	Filing, Office Machines, General Office
	14.040100	Communication Systems Clerks/Operators
	14.040200	Correspondence Clerks
	14.040300	Mail and Postal Clerks
	14.040500	Messengers
	14.040600	Receptionists/Information Clerks
	14.049900	Information Communication Occupations, Other
	14.050100	Planning and Production Clerks
	14.050500	Traffic, Rate, and Transportation Clerks
	14.059900	Material Support Occupations, Other
	14.060300	Personnel Assistants
	14.080200	Budget Management Analysts
	14.080300	Clerical and Office Supervisors
	14.080500	Office Managers/Chief Clerks
	14.090100	Clerk-Typist
	14.990000	Office Occupations, Other
Secretarial	14.070200	Secretaries
	14.070300	Stenographers

Cluster	USOE Code	USOE Instructional Program
Industrial Mechanics	16.011300	Mechanical Technology
	17.010100	Cooling
	17.010200	Heating
	17.030200	Mechanic (Auto)
	17.030300	Specialized Mechanic
	17.039900	Automotive Services, Other
	17.040100	Aircraft Maintenance
	17.060000	Business Machine Maintenance
	17.100000	Construction and Maintenance Trades
	17.100301	Maintenance, Heavy Equipment
	17.109900	Millwright
	17.120000	Diesel Mechanic
	17.310000	Small Engine Repair
	17.320000	Stationary Energy Sources
Construction	16.010300	Architectural Technology (Building Construction)
	16.010600	Civil Technology
	16.010601	Roadway Technology
	17.100000	Construction Superintendent
	17.100100	Carpentry
	17.100302	Operation, Heavy Equipment
	17.100400	Masonry
	17.100500	Painting and Decorating
	17.100600	Plastering
	17.100700	Plumbing and Pipefitting
	17.100800	Dry-Wall Installation
	17.100900	Glazing
	17.101000	Roofing
	17.109900	Construction and Maintenance Trades, Other
	17.360100	Millwork and Cabinetmaking
Electricity/ Electronics	16.010700	Electrical Technology
	16.010800	Electronic Technology
	17.020000	Appliance Repair
	17.100200	Electricity
	17.140100	Industrial Electrician
	17.140200	Lineman
	17.140300	Motor Repairman
	17.150100	Communications
	17.150300	Radio and Television
	17.320100	Electric Power Generating Plants
Metals	16.011100	Industrial Technology
	16.011300	Mechanical Technology
	16.011400	Metallurgical Technology
	17.030100	Body and Fender
	17.210100	Instruments (Other than timepieces)
	17.210200	Watchmaking and Repair
	17.230100	Foundry
	17.230200	Machine Shop
	17.230300	Machine Tool Operators
	17.230400	Metal Trades Combined
	17.230500	Sheet Metal
	17.230600	Welding and Cutting
	17.230700	Tool and Die Making
	17.230900	Metal Patternmaking
	17.239900	Metalworking, Other
	17.240000	Mettalurgy
	17.270000	Plastics Occupations
Child Care	09.020100	Care and Guidance of Children

Cluster	USOE Code	USOE Instructional Program
Clothing (Fabrics)	09.020200	Clothing Management/ Production/Services
	09.020400	Home Furnishings/ Equipment/Services
	17.160000	Fabric Maintenance Services
	17.160100	Drycleaning
	17.160200	Laundering
	17.169900	Fabric Maintenance Services, Other
	17.330000	Textile Production and Fabrication
	17.330200	Tailoring
	17.339900	Textile Production and Fabrication, Other
	17.350000	Upholstering
Institutional and Home Management	17.110000	Custodial Services
Drafting	17.130000	Drafting
Graphics	17.070000	Commercial Art Occupations
	17.090100	Photo-Lab Darkroom Occupations
	17.190100	Composition, Makeup, and Typesetting
	17.190200	Printing Press Occupations
	17.190300	Lithography
	17.190400	Photoengraving
	17.190500	Silk Screen
	17.190600	Bookbinding
	17.199900	Graphic Arts, Other

Cluster	USOE Code	USOE Instructional Program
Service	000H1401	Law
	000H1510	Religious Studies
	04.110000	Hotel and Lodging
	04.180000	Recreation and Tourism
	04.190000	Transportation
	14.049900	Librarian (including assistants)
	14.060100	Educational Specialists and Assistants
	14.060200	Interviewers and Test Technicians
	14.069900	Personnel, Training, and Related
	17.260100	Barbering
	17.260200	Cosmetology
	17.269900	Personal Services, Other
	17.280000	Public Service Occupations
	17.280100	Fire Training
	17.280200	Law Enforcement Training
	17.289900	Public Service Occupations, Other
	17.340000	Leatherworking
	17.340200	Shoe Repair
Forest Products	01.060100	Forest Management
	01.070300	Logging
	01.070600	Special Products
	01.070602	Paper Goods Machine Operator
	16.010501	Pulp and Paper
	16.010502	Composition Products
	16.010602	Sanitation Technology
	17.100302	Operation, Heavy Equipment
	17.360101	Planing Mill Operators
	17.360102	Wood Turning Operators
	17.369900	Woodworking, Other

Cluster	USOE Code	USOE Instructional Program	Cluster	USOE Code	USOE Instructional Program
Forest Products	17.369901	Sawmilling			
	17.369902	Veneer and Plywood			

APPENDIX 1-B1

Community College Program Projections

Appendix 1-B1 illustrates how the state level program planner might choose to arrange the employment and job opening estimates, projected enrollment and completions, and the community colleges' percentage of planned supply (training responsibility) for projecting selected community college vocational programs. (This percentage will usually be an estimate less than 100 percent because high schools, proprietary schools, apprenticeship programs, et al, will assume training responsibility for their share; the overall total equaling 100 percent.) The same steps would be used for projecting high school vocational programs. Only the percent of planned supply would probably change. For example, the percent of planned supply for heavy equipment mechanics might likely be 20 percent. (To project for high school cluster programs the procedure discussed relating to Appendix 1-B2, page 58, should be used.)

By using the format shown in Appendix 1-B1 and applying the formula discussed in the program planning model it can be determined that 2.4 motorcycle mechanic programs are needed in the state at the community college level. This estimate in the sample illustrated is revised downward to two such programs after receiving input from the industrial mechanics program specialist at the Department of Education. This decision is made by the specialist only after careful consideration of the implications of the resulting formulated program need and such other considerations as the possibility of increasing the enrollment in existing programs, cost of implementing additional programs, changing modes of transportation, general

APPENDIX 1-B1

COMMUNITY COLLEGE PROGRAM PROJECTIONS[1]

(Statewide)

USOE Program Group	(a) 1978 Est. Employ.	(b) 1978 Est. E/P	(c) No. of Curr. Prog.	(d) Current + 1 Prog. Enroll.[2]	(e) Current + 1 Prog. Completers[2]	(f) COMMUNITY COLLEGES % of Planned Supply	(g) Supply Needed	(h) Net Need	(i) Enroll/ Program	(j) New Programs Needed[3]	(k) Adjusted Programs Needed
Motorcycle Mechanic	2,000	220	2	250	25	25	55	30	125	2.4	2
Diesel Mechanic	1,110	46	3	732	149	55	25	(124)	244	(2.5)	0
Heavy Equipment Mechanic	6,550	198	5	340	68	55	108	40	68	2.9	3
Air Conditioning	850	45	1	128	16	55	24	8	128	0.5	0
Automotive Mechanic	10,150	409	13	3,073	448	25	102	(346)	236	(10.4)	0
Automotive Parts Person	850	44	3	136	40	20	9	(31)	45	(2.3)	0

1. Community college program projections are by USOE instructional program.
2. Projected enrollment and completions are by unduplicated headcount. This method of projecting thus includes both full-time and part-time students.
3. New programs needed are determined by applying the formula discussed in the program planning model. Programs in brackets ( ) indicate a negative need.

population shifts, and those other critical elements examined in the program planning model.

The table shows that three of the USOE occupational program groups indicate a negative need for programs. These include diesel mechanic (2.5 programs), automotive mechanic (10.4 programs), and automotive parts person (2.3 programs). The negative number is the result of the excess of projected completers to the supply needed from the community colleges. This excess thus reflects itself in the net need for community college program completers, and when applied to the projection formula results in negative program needs.

As the program planner gains experience using the ideas addressed in the model, the planned percent of supply for that educational level (in this case the community colleges) may need to be changed in order to more correctly identify the most reasonable percent of planned supply for that program. For example, if the planned supply for motorcycle mechanic was revised from 25 percent to 50 percent the new programs needed would change from 2.4 to 4.8 programs. Conversely, a reduction in the percent to 12.5 would change the number to 1.2 new programs. It becomes extremely important, therefore, that the percentage selected be representative of the training output reasonably expected and attainable from that educational level.

Another issue that must be examined is what to do when there are negative programs indicated. Should a certain number of programs be eliminated when a negative estimate is computed? In the examples shown no programs were eliminated as noted in the Adjusted Programs Needed column (Column k). The decision not to reduce the number of programs might be made for any number

of reasons. Common reasons for not reducing any of the three programs might be justified as a result of any of the following:

1. Loss resulting from closure of large capital outlay programs, e.g., diesel.
2. Natural reluctance to close existing programs.
3. Existing program facilities may be used for occupational updating programs.
4. Planned percent of supply may need to be re-examined.
5. Projected enrollments and/or completions may need to be re-examined.

Regardless of the above good intentions not to reduce certain programs (items 1-3), future shortages of some training resources and continued decreases in student populations may eventually bring about program reductions.

APPENDIX 1-B2

High School Cluster Program Projections

Should the program planner desire to project for high school cluster programs the format in Appendix 1-B2 would be used. Since cluster programs in Oregon address all the USOE program groups in that cluster the employment and job opening estimates for each such group are used to determine the totals for these estimates as shown. Notice that the 1978 estimated employment and job openings (1978 Est. E/P) are 31,208 and 1,357, respectively. Beginning at that point only these totals are subsequently used. No other attention is then given to the USOE program group or its respective employment figures.

APPENDIX 1-B2

HIGH SCHOOL CLUSTER PROGRAM PROJECTIONS[1]

(Statewide)

USOE Program Group	(a) 1978 Est. Employ.	(b) 1978 Est. E/P	(c) No. of Curr. Prog.	(d) Current + 1 Prog. Enroll.	(e) Current + 1 Prog. Completers Available for Placement	(f) % of Planned Supply	(g) Supply Needed	(h) Net Need	(i) Enroll/ Program	(j) New Programs Needed	(k) Adjusted Programs Needed
Automotive Parts Person	850	44									
Mechanical Technology	1,860	80									
Cooling	500	29									
Heating	350	16									
Automotive Mechanic	10,150	409									
Specialized Mechanic	4,100	168									
Automotive Services, Other	608	40									
Aircraft Maintenance	320	8									
Business Machine Maintenance	870	27									
Construction/Maintenance Trade	450	17									
Heavy Equipment Mechanic	6,550	198									
Diesel Mechanic	1,110	46									
Motorcycle Mechanic	2,000	220									
Stationary Energy Sources	1,490	55									
TOTAL	31,208	1,357	55	2,800	480	25%	339	(141)	50	(16.6)	0

1. High school cluster program projections use only the totals for the specific cluster not the individual USOE program group. The USOE program group is used only when planning specifically for that vocational program group. This is the procedure described in Appendix 1-B1.

The calculation for the new programs needed is then simply determined by using the projection formula already discussed. The only exception is that those high school cluster program completers who are available for placement are used instead of all those who have completed the program; the reason being that Oregon's high school follow-up study shows that only some 40 percent of the state's cluster completers are available for placement. The other 60 percent move on to college, get married, go into the military service, or take themselves out of the labor market for other such reasons. Oregon's follow-up study of community college students indicated no such pattern.

In the example shown in Appendix 1-B2 the new programs needed shows a negative number of new programs needed, i.e., 16.6. There are any number of reasons for 16 fewer programs being needed. Significant ones to be aware of are (a) limited job openings (1,357), (b) a greater number of cluster completers available for placement than needed from the high schools (480 to 339), and (c) perhaps an unrealistic estimate of planned supply from the high schools for this cluster group (Industrial Mechanics). As an example if the percent of planned supply had been 40 percent and all other givens remained the same, the supply needed would change from 339 to 542. This would change the net need from (141) to 62, and thereby change the estimate from (16.6) to 7.2, new programs.

From this example it is apparent that the estimates and percentages used must be reliable if high school cluster programs are to be forecasted accurately. Every effort is presently being made in Oregon to improve the data base used for both high school cluster and community college program projections.

DANAS
Data Applications Needs Assessment System
(Curriculum/Instructional Materials)

- INPUTS -

DATA SOURCES

LEA (Local Educational Agencies)

IED - Regional Coordinators (Intermediate Education Districts)

Occupational Deans

Instructional Deans

Department Chairpersons

Instructional Staff

Program Advisory Committee

Curriculum Persons - Directors

Career Education Directors/Coordinators

Teacher Education Advisory Committee

Teacher Education Agencies - Institutions

State Director, Vocational and Career Education

State Curriculum Specialist

State Curriculum Coordinators

Instructional Division - Development Center

State Curriculum Advisory Committee

OREGON DEPARTMENT OF EDUCATION
INSTRUCTION DIVISION--DEVELOPMENT CENTER
CURRICULUM/INSTRUCTIONAL MATERIALS DEVELOPMENT UNIT

- DANAF -
DATA APPLICATION NEEDS ASSESSMENT FORM

1. Sequence Number
2. LEA County-District School Number
3. LEA County-District School Name
4. LEA County-District School Address
5. Community College Number
6. Community College Name
7. Community College Address
8. Local Administrator--Completing Form
9. Level of Education: 10, 11, 12, 13, 14
10. Program Codes

A.	Agriculture	J.	Electronics
B.	Marketing	K.	Metals
C.	Health	L.	Child Care
D.	Food Service	M.	Clothing
E.	Accounting	N.	Home Management
F.	Clerical	O.	Drafting
G.	Secretarial	P.	Graphics
H.	Mechanics	Q.	Service
I.	Construction	R.	Forest

11. Curriculum Needs Goals

A.	New	D.	Implementation
B.	Revision	E.	Evaluation
C.	Additional	F.	Field Test

12. Curriculum Needs Assessment--Based on:

A. Occupational Analysis
B. Job Analysis
C. Task Analysis
D. Content Analysis
E. Skill Inventories
F. Critical Incident Analysis
G. Functional Criterion Analysis
H. Instructional Analysis
I. Curriculum Analysis
J. Manpower Data Analysis

13. Extent--Curriculum Needs Assessment

A. Occupational Cluster Guide
B. Program Content Identification
C. Course Sequence Content Identification
D. Course Content Identification
E. Task--Competencies Identification
F. Instructional Analysis for Learning Experiences
G. Learning Module(s) Content
H. Learning Module(s) Scope
I. Learning Module(s) Sequence
J. Curriculum Guide Development
K. Curriculum Guide Revision
L. Minimum Standards
M. Competency Card Certificate
N. Shopping List of Competencies
O. Content--Curriculum Scope/Sequence
P. Diagnostic Assessment

14. Curriculum Needs Approach

A. Competency-Based

B. Individualized

C. Minimum Standards

D. CAI-CMI Computer Assisted/Computer Managed Instruction

E. Open-Entry/Open-Exit

F. Year-Round Operations

G. Cognitive Learning Styles Prescription

H. Learning Alternatives

15. Curriculum Needs Status

A. LEA C. State

B. IED D. Combination

16. Student Group Needs

A. Regular Program

B. Special Needs

1) Disadvantaged

2) Handicapped

C. Sex Bias Elimination

17. Curriculum Materials--Software

A. (T) Transparencies

B. (F) Flippack

C. (P) Printed Matter

D. (C) Audiotape Cassette

E. (S) Color Slides

F. (R) Audiotape Reel

G. (V) Videotape

H. (E) Slide-Tape

I. (M) Film-Filmstrip

18. Curriculum Hardware--(Specify Needs)

19. Curriculum Needs Timetable

A. Immediate (1-6 months)
B. Present (6-12 months)
C. Short-Range Future (1-2 years)
D. Long-Range Future (2-5 years)

20. Curriculum Materials Procurement

A. Develop/Subcontract

B. Purchase

C. Revise

21. Curriculum Needs Development Timeline

A. Initiating

B. Ongoing

C. Terminating

22. Curriculum Content Areas

A. Worker Concepts Within Occupation

1) Attitudes
2) Responsibilities
3) Skills
4) Interests
5) Aptitudes
6) Abilities
7) Educational Background/Preparation

B. Occupational Concepts

1) Comparative Analysis--Occupational Areas

2) Pay--Basis, Differential

3) Job Relationships: Subordinates, Peers, Superiors

4) Organized Labor--Role

5) Apprenticeship

6) Physical-Mental Requirements

7) Leadership Standards--Personal Development

C. Basic Skills Concepts

1) Communications

a) Written

b) Oral

c) Specialized

2) Language

3) Reading

4) Human Relations

5) Social Skills

6) Math-Related to Occupation

7) Job Sequence

a) Preparing
b) Applying
c) Obtaining
d) Keeping
e) Changing

D. Occupational Content

1) Standards/Codes

2) Equipment

3) Tools

4) Materials

5) Processes

6) Procedures

7) Products

8) Evaluation

a) Codes

b) Procedures

c) Personnel

d) Requirements

e) Standards

f) Levels: Minimum-Maximum

9) Safety

23. Curriculum Needs Funding Request

A. LEA
B. IED
C. State
D. Federal
E. Combination
F. Interagency

24. Curriculum Needs Decision Status

A. Request Further Information from Supplier(s)

B. Submit to State Curriculum Advisory Committee

C. Refer to Curriculum Development Unit

D. Refer to Instructional Division--Development Center

E. Process for Funding

F. Study Further

G. Procure Existing Materials

25. Curriculum Needs Assessment--Meets:

A. Local Priorities
B. Regional Priorities
C. State Priorities
D. Federal Priorities
E. Interagency Priorities

STATE CURRICULUM ADVISORY COMMITTEE REPRESENTS:

1 - State Curriculum Specialist (Chairperson)

2 - State Curriculum Coordinators

3 - LEA (Local Education Agencies)

3 - IED (Intermediate Education Districts)

2 - Teacher Education Personnel

2 - Business and Labor Leaders

6 - Curriculum Persons - Directors

1 - Instructional Divison - Development Center

2 - Instructional Staff

1 - Apprenticeship representative

23 Total Recommended Membership

OREGON DEPARTMENT OF EDUCATION
STATE SPECIALISTS
VOCATIONAL/CAREER EDUCATION

Disadvangated Handicapped

Conservation and Forest Products

Industrial Arts

Agriculture Education

Program Development and Evaluation

Home Economics/Consumer Homemaking

Career Awareness

Service Occupations

Career Development

Electronics and Graphics

Marketing and Distribution

Personnel Development

Business and Office Education

Manpower Instructional Services

Cooperative Work Experience and On-the-Job Training

Metals and Building Construction

Apprenticeship Training

Agri-Business Education

Program Planning

Manpower Analysis

Health Occupations

Career Program Operations

Manpower Development

Industrial Mechanics

Manpower Services

Career Exploration

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